COTTON AND LINEN

THOMPSON

Courtesy of U. S. Department of Agriculture

Cotton Picking

DEPARTMENT STORE MERCHANDISE MANUALS

THE COTTON AND LINEN DEPARTMENTS

BY

ELIZA B. THOMPSON

Former Store Teacher, Stern Brothers, New York City, and A. I. Namm and Son, Brooklyn, N. Y.; Instructor of Textile Merchandise Courses, New York University.

EDITOR OF SERIES

BEULAH ELFRETH KENNARD, M. A.

Director of Department Store Courses, New York University; Chairman of Committee on Merchandise Courses for New York City Public Schools; Former Educational Director, Department Store Education Association.

CONSULTING EDITOR

LEE GALLOWAY, Ph.D.

Associate Professor Commerce and Industry, New York University; Secretary of National Association of Corporation Schools; Director Educational Courses, National Commercial Gas Association.

NEW YORK
THE RONALD PRESS COMPANY
1917

This Series is Dedicated

to Mrs. Henry Ollesheimer, Miss Virginia Potter, Miss Anne Morgan, and other organizers of the Department Store Education Association, who desiring to give greater opportunity for advancement to commercial employees and believing that all business efficiency must rest upon a solid foundation of training and education gave years of enthusiastic service to the testing of this belief.

EDITOR'S PREFACE

This series of department store manuals has been prepared for the purpose of imparting definite and authentic information to that growing army of salespeople who are not satisfied to be mere counter servers — to those who realize that their vocation is one of dignity and opportunity, and that to give satisfactory service to the customer they must possess a thorough knowledge of the goods they sell, as well as a knowledge of how best to sell them.

These manuals were planned and prepared as the result of many months of teaching department store salespeople in a number of large stores in New York and other cities. Later a series of courses for teachers of department store salesmanship was introduced into the curriculum of the School of Pedagogy of New York University. This gave additional opportunity for the study of store conditions and needs from the point of view of the teacher. Thus the material in these books has been tried out with the salespeople in the store and also with those who have proven themselves to be successful teachers.

In the preparation of these manuals we have received the most cordial co-operation from experts in the various lines of merchandise and from manufacturers who have freely given their time and valuable counsel. To all of these the authors and editors of this series wish to express their grateful appreciation.

BEULAH ELFRETH KENNARD.

AUTHOR'S PREFACE

A knowledge of textiles is necessary for anyone who sells textile materials. The salespeople in the Cotton Goods Departments should know how cotton is grown and picked, how it is manufactured into cloth, and especially should understand the finishing processes which make one cotton material differ from another. Otherwise they cannot judge qualities and values.

Linen should be studied in the same way, from flax to table linen, or other fine material.

As these two vegetable fibers are alike in so many ways and are sold and used for the same purposes they may well be studied together. This manual includes the principal departments in which cotton and linen are found, except the upholstery and curtains, the laces, and the ready-to-wear departments which need special treatment.

Thanks are due to Dr. Paul Nystrom, the author of "Textiles," Miss L. R. Balderston, and Mrs. Ellen B. McGowan of Teachers' College, and to James McCutcheon and Company for valuable help and criticisms. For illustrations thanks are due to The United States Department of Agriculture, The American Museum of Natural History, James McCutcheon and Company, The Spool Cotton Company, and The York Street Flax Spinning Company.

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INTRODUCTORY

Uses of Cotton Goods

A large variety of materials is found in the Cotton Goods Department, differing both in kind and quality. These range from the coarser fabrics for dresses for morning wear, to the very fine and sheer qualities especially desirable for young girls' graduation and evening dresses.

There is also the variety of materials for undergarments from the coarser cottons to the fine nainsooks and batistes. The fine materials are suitable for infants' and children's wear, and the coarser materials for men's and boys' aprons, etc.

Since the discovery of the mercerization of cotton, table clothes and napkins have been made to imitate linen, and for ordinary household use, cotton is fast taking the place of linen, especially as during the war linen has been almost unobtainable. Cotton has also been treated so that it will absorb moisture, making it more suitable for toweling than formerly.

Divisions of the Department

According to the size of the store and, consequently the size of the department, different divisions are made in different stores. In some large stores, the division is as follows:

1. Domestics, goods that are made in the United States. These are mostly staples.
2. White Goods, including both imported and domestic materials.
3. Dress Goods, including domestic and imported materials.
4. Linings.
5. Flannels.
6. Blankets and Comfortables.

Cotton Yard Goods

The materials which belong in the yard goods divisions include the following:

1. *Domestics*

Calico
Cambric
Canton Flannel
Cheese-Cloth
Denim
Galatea
Gingham
Lawn
Longcloth
Muslin.
Nainsook
Percale
Sateen
Sheeting
Pillow-Case Tubing

2. *White Goods*

Batiste
Corduroy
Crêpe
Dimity
Flaxon
Gaberdine
India Linen
Lawn
Madras
Marquisette
Mull
Organdy
Persian Lawn
Piqué
Poplin
Swiss
Voile

3. *Dress Goods*

Cheviot
Chiffon
Corduroy
Crêpe
Crêpe de Chine
Dimity
Gingham
Japanese Crêpe
Khaki
Lawn
Marquisette
Mull
Organdy
Piqué
Poplin
Swiss
Voile

4. *Linings*

Buckram
Cambric
Canvas
Crinoline
Drilling
Lawn (Colored)
Moreen
Near-Silk
Percaline
Sateen
Silesia
Imitations of Silk
Interlinings
Cotton Wadding
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Heatherbloom

Chapter II

SOURCES AND CULTIVATION OF COTTON

Importance of Cotton

Cotton is the most important vegetable fiber, as it makes the cheapest and most useful of all textile materials.

It is the short, fluffy fiber which grows around and is attached to the seed of the cotton plant. These fibers cling close together and can be drawn out into a continuous slender thread. Cotton yarn is therefore an elongated mass of fibers. The strength, length, and evenness of the fibers determine its value. The fiber is known as the staple.

Conditions Necessary for Cultivation of Cotton

A long season is needed for raising cotton. About 35 degrees north and south of the equator where there is a long season of continuous warm weather, is the range for cotton growing. Plenty of rain is required during the first part of the season, and sunshine during the latter part. The humidity in the air, which comes from nearness to the sea affects the cotton so

that it grows more rapidly and produces a longer and finer variety of fiber.

United States the Chief Source of Supply

The southern states of the United States have just the right climate for the successful growing of cotton, and the result is that the United States produces three-fourths of all the cotton used in the world.

The states arranged in order of production are:

Texas	Tennessee
Mississippi	Florida
Georgia	Missouri
Alabama	Virginia
Arkansas	Oklahoma
North Carolina	Kentucky
South Carolina	California

Varieties of American Cotton

There are two principal varieties of cotton grown in the United States: Sea Island cotton and Upland cotton.

Sea Island cotton is a long staple cotton, fine and silky. The fibers are from 1¾ to 2½ inches long. Strong warp yarns are made of this cotton. It is used chiefly for the finest lawns and muslins and for spool cotton.

Upland cotton is a short staple cotton, soft and

fairly strong. The fibers are from ¾ to 1¼ inches long, or about half the length of the Sea Island cotton. This variety is used for filling or weft yarns. Ginghams, calicoes, sheetings, and coarser materials are made from this cotton. (See Figure 1 for illustrations of the different staples.)

Egyptian Cotton

Egypt ranks next to the United States in the quality of the cotton produced and much Egyptian cotton is imported into this country, as it is better adapted to some purposes than American cotton.

The fibers are long and silky, measuring from 1¼ to 1¾ inches, but they are not so good in quality as the Sea Island cotton. They are brown on account of the coloring matter in the waters of the river Nile. A system of irrigation is used in Egypt to furnish moisture for the growth. It is used in making fine fabrics, underwear, and hosiery.

Peruvian Cotton

Peru in South America, because of its favorable climate, long season, and suitable soil, grows a very large amount of cotton.

The fibers are rough, harsh, and wiry, fairly strong and 1 to 1¼ inches in length. It resembles wool and is used to mix with wool.

Figure 1. Different Staples of American Cotton with Seeds
(The longest staple is Sea Island cotton.)

Courtesy of U. S. Department of Agriculture

Figure 2. Cotton Bolls

Indian Cotton

India produces a large amount of cotton which is sent to Germany and other parts of Europe and to Japan. The fibers of Indian cotton are short and coarse, and about ¾ of an inch long. It is used for low-grade cloth.

Other Sources of Supply

China, Russia, and other countries raise cotton but very little is exported.

Properties of Cotton

The distinctive qualities of cotton are that it:

1. Burns easily on account of natural oil and cellulose in the fiber.
2. Soils easily on account of short fibers.
3. Does not absorb water readily and dries slowly on account of vegetable gum and oil in the fiber.
4. Crushes readily because a vegetable fiber.
5. Shrinks because the finish which pulls the fiber out is loosened by water and soap and the fiber goes back to its original twisted shape.
6. Is non-conductor of heat, therefore good for summer underwear.
7. May be laundered without injury to the fibers.

Cotton Growing

The seeds are planted in March, April, or May, frequently by machine. They are planted in rows, close together. Later the plants are thinned and left from 8 inches to 14 inches apart.

Four months are required from the planting to the ripening of the seeds. The blossom, which resembles a hollyhock, lasts only one day, during which time the color changes from yellow in the morning, to white at noon, and pink in the evening when it drops off. The boll begins to form as soon as the blossom drops off. The plant blossoms first at the bottom and from there to the top. (See Figure 2.)

Cotton is sometimes injured by a wet season, an early frost, or a severe sand storm. Insects such as the boll-weevil sometimes destroy cotton crops.

Cotton Picking

Cotton is picked during the months of July and August, and in the fall until frost comes. It is usually picked by hand. Several machines have been invented for the purpose, but as the bolls do not all ripen at one time a machine cannot be used to advantage. As the plant begins to blossom at the bottom and the bolls form there first ripening gradually toward the top, it is necessary to go over a field two or even three different times. Bolls which are not ripe are often

forced open and sent on with the ripe cotton, but this lowers the quality. Ripe cotton when seen under the microscope shows a twist which lends itself readily to the spinning, while the unripe fiber has no twist, will not spin readily, is not strong, and will not hold the dye as well as the ripe fiber. This mixing is done by dishonest raisers who also sometimes wet cotton to make it heavier.

Negroes (men, women, and children) are employed in the picking of cotton, which they take from the opened boll and put in a bag hanging at their side. When the bag is full they go to the end of the row of plants and empty it into a large basket. (See Frontispiece.)

Each person's work is weighed and an account kept of it. Cotton pickers work from six o'clock in the morning until six o'clock at night. Two hundred pounds is about an average day's work and they receive from 40 to 50 cents a hundred pounds.

The baskets are taken to the cotton house and the cotton is piled up in the cotton room. It is then sent to the cotton gin for the removal of seeds.

Cotton Ginning

In this process, sharp knives or saws in the machine cut through the fibers and the seeds drop out. This injures the fibers somewhat.

The Sea Island cotton seeds are easier to remove as the cotton does not cling so tightly to them. They are black and shiny and are removed by passing the fibers between closely set rollers through which the seeds cannot go.

The cotton gin was invented by Eli Whitney in 1794, and caused a wonderful development of the cotton industry.

Baling

After the seeds are removed the cotton is put in large bales of 500 pounds in weight. Egyptian bales weigh 700 pounds. Each bale is put under heavy pressure in a hydraulic press, until it is reduced to about half its original size. Bagging and iron bands are put around the bale for protection. This becomes the raw cotton of the market. (See Figure 3.)

Marketing

When the cotton is ready for market, it may be sold in various ways. The cotton farmer may sell to some local storekeeper who makes a business of buying cotton, or to some local cotton buyer or factory. There are also cotton dealers and brokers, located in the larger cities to whom he may sell. Again he may sell to traveling buyers sent by cotton merchants or manufacturers, or he may sell direct to the cotton

Courtesy of U. S. Department of Agriculture

Figure 3. Cotton Baled for Shipping

spinning mill, especially if it is near enough so that the cotton may be transported easily.

Grading

In any case the buyer of the cotton grades it by examining the cotton in the bale, pulling out a little for this purpose.

The quality of the cotton depends upon the fineness or coarseness of the fiber, the length of the fiber, and its breaking strength. As each bale of cotton is supposed to weigh 500 pounds, it is necessary for the buyer to determine whether this weight is partly made of dirt, leaves, and too much moisture.

Dead or unripe fibers, or those damaged by frost or insects lower the grade of the cotton. The color and luster of the cotton is also considered. All these things must be taken into account in determining the grade of cotton.

Mistakes in grading are possible because there may be many varieties of cotton in one bale and the sample may come from the poorer or better variety.

The standard grades of cotton generally recognized in the cotton markets are as follows:

Fair
Strict middling fair
Middling fair
Strict good middling

Good middling
Strict middling
Middling
Strict low middling
Strict good ordinary
Good ordinary
Strict ordinary
Ordinary

Cotton which is discolored is classed as tinged if only slightly discolored or stained if it has a deeper color, as for instance, "strict good ordinary tinged" or "good middling stained." Cotton crops vary in color; one may be bright and white, another creamy, another dingy. Consequently, cotton may be said to be of "good color" meaning that while it may not be very white, still it is neither tinged or stained.

The Cotton Exchange

This is a market-place or building where cotton is bought and sold. There are certain rules laid down by an association which is made up of cotton merchants, local dealers, cotton brokers and exporters, and some cotton spinners. These rules tell how the business is to be conducted and the cotton graded. Much of the cotton which is bought and sold at the exchange is never seen by the cotton broker.

Spot Sales and Future Sales

In the cotton exchange two kinds of sales are made. The spot sale calls for the delivery of the cotton at once, while with the future sale the cotton is to be delivered at some future time. There is the element of speculation in buying or selling for future delivery as the cotton may not even be grown and much might happen to the crops before they could be delivered. If there is a good crop and the price of cotton goes down the broker may lose, while if there is a poor crop and a good demand for cotton, then the price will go up and he will make a good profit. If he concludes that he is likely to lose on his deal he goes to the cotton exchange and tries to sell his contract at as low a price as possible, and so the risk is transferred to a third party who in turn may see his mistake and sell to another party and so on. This process is known as "hedging."

Chapter III

SPINNING

Processes of Manufacture

The manufacture of cotton is the leading industry in the textile world. From the time that the raw cotton is brought to the factory in the bale, until the goods are ready to be sold in the store the processes of its manufacture may be grouped under three heads:

Spinning
Weaving
Finishing

These processes are not always completed in one place. Often the spinning is done in one mill, the weaving in another, and the finishing in still another. Some concerns buy goods from one factory "in the gray," which is really unbleached cotton, and engage another factory to dye and finish it for them.

Spinning

Spinning is the drawing and twisting of fibers to form a continuous thread.

Although the process of spinning may seem very complicated when we see the machinery in a cotton mill, these great machines are only separating the matted and tangled fibers and drawing them out into a continuous strand. This strand is combed or carded so that the fibers may be parallel and smooth, and it is twisted so that it may be strong for weaving.

The processes in the factory may be better understood if spinning is seen in its simpler form and followed through the various stages of its later development.

Origin of the Art of Spinning

The art of spinning is so ancient that its origin is unknown. Wool and flax were the first fibers used for textiles. Cotton was more difficult to spin on account of its short fibers and was used very little until the invention of machinery for spinning.

The Egyptians, Greeks, and Chinese all claim the discovery of the art of spinning, but there is no absolute proof in any case. It is certain from pictures found on Egyptian tombs that flax was used there at a very early time. The spinning of cotton by hand was developed first in India.

Hand Spinning

The three processes of spinning are:

Drawing
Twisting
Winding

The first spinning was done by drawing out the fiber and twisting it with the fingers; then winding it on a stick or a stone to keep it from becoming tangled.

The Spindle

The stick on which the spun thread was wound in early times was later called a spindle. By dropping it with a twirling motion it was made to do the twisting. It was soon found that a full spindle revolved faster than an empty one and a piece of stone, clay, or metal was attached to make it revolve faster and twist better. This weight was called a whorl.

The Distaff

The stick on which the bunch of raw unspun fibers was placed was called the distaff. If both hands were to be left free for spinning, it could be held under the left arm or placed in the girdle.

This process of spinning was used from before the dawn of history until the fourteenth century and may still be found among primitive people.

Hand Cards

At first the fibers were straightened by the fingers

but this was found to be unsatisfactory and so boards with upright wires were used for this purpose. By rubbing the wires of one board against the wires of the other the fibers were straightened, cleaned, and made ready for spinning.

Spinning Wheels

The Great Wheel or Jersey Wheel. The first and simplest spinning wheel was made during the fourteenth century and was used for spinning wool. It consisted of a large wheel connected by a band to a smaller wheel which turned the spindle. The spindle was in a horizontal position. The woman spinning stood at the side and turned the large wheel with her right hand. With her left hand she drew out the thread which came twisting from the end of the spindle; when it was long enough she stopped and turning the wheel again, wound it on the spindle. This wheel had no place for the distaff, and it was necessary to pick up new fibers constantly. Here again are seen the three processes, drawing, twisting, and winding.

The Flax Wheel or Saxony Wheel. The flax wheel was the next improvement. It was run by foot-power and the spinner could now twist, draw, and wind without stopping the wheel. Around the spindle was a horse shoe arrangement called a " flier " which twisted

Figure 4. Flax Wheel

the thread and on this flier were hooks for distributing the thread evenly on the spindle. The distaff for holding the fiber was now fastened to the frame. The motion of this wheel was continuous.

The thread made on the Saxony wheel was drawn out and twisted better than that on the great wheel. On account of its greater strength it was used for the warp or foundation thread of cloth, while the thread from the great wheel was used for weft or filling.

These wheels were used from the fourteenth to the eighteenth centuries and all yarns for clothing and household materials were made in this way.

Inventions of Spinning Machines

In 1764 James Hargreaves invented a machine whereby eleven spindles could be wound at once. This was based on the principle of the great wheel, the thread being drawn out and twisted and afterwards wound on the bobbins. He named his machine the spinning jenny using his wife's name. This furnished the weft or filling thread.

In 1768 Richard Arkwright invented a machine on

the principle of the Saxony wheel. This had rollers at the top going at different speeds for drawing out the threads, and the spindles which were at the bottom of the machine had the fliers for twisting the thread as it was wound on the bobbins. The machine was run by water-power and was called Arkwright's water frame. It furnished warp for the weavers.

In 1779 Samuel Crompton, a textile worker, invented a machine which was a combination of Hargreaves' jenny and Arkwright's water frame and was called Crompton's mule. With this machine much finer thread could be spun.

In 1830 Roberts, by means of an invention called a "quadrant," succeeded in making the mule self-acting.

The Industrial Revolution

These and other inventions following one after another during the period from 1750 to 1800 changed the whole textile industry. The invention of the steam engine by Watts in 1769 came during this time, also the invention of the cotton gin by Eli Whitney in 1793. Factories were built and the spinning and weaving of cloth which had always been done in the home was transferred to the factory where machines could be used to advantage. These inventions were of the greatest importance to the cotton industry which developed with wonderful rapidity.

Samuel Slater

During the years when some of these wonderful inventions were being made in England, the United States was at war with that country, fighting for her independence. On account of the war and the fact that laws were made to prohibit any models or drawings from being brought to this country, none of the inventions could be brought over, but Samuel Slater was able to construct a machine from memory as he was familiar with Arkwright's spinning frame in England. He was called the father of the textile industry. The first machine was made in Pawtucket, R. I., in 1790.

Spinning in the Mill

The following are the processes through which the raw cotton passes after being received at the mill:

1. *Opening.* The bale is opened. Iron bands and burlap coverings are removed.

2. *Breaking and Pulling.* The cotton is broken and pulled apart. It is put into a machine which breaks up the hard lumps of cotton and pulls the fibers apart.

3. *Mixing.* After the cotton is opened up in the bale-breaker it is mixed to form one quality of cotton. This consists in taking fibers of equal length, all of the same variety, but perhaps different pickings, which may not be the same grade and mixing them together.

4. *Picking and Scutching.* The picking machines loosen the matted fibers and beat out the sand, leaves, and pieces of boll, which fall through a wire lattice. The cotton is formed around the cylinder in a sheet or "lap" like cotton batting.

The scutching machines continue the work of cleaning the fibers. Four laps from the picking machine are fed to the scutcher and come out as one single sheet or lap, each time cleaner than before.

5. *Carding and Combing.* Carding is a very important process for it not only cleans the cotton from dirt, sticks, and other impurities which have not been removed by previous processes, but disentangles and straightens the fibers, and lays them parallel.

The wide lap of cotton, as it comes from the previous machine is placed in the carding machine where the fibers are straightened and drawn out into a thin filmy layer of cotton about forty inches wide. This sheet as it comes out passes through a sort of metal funnel which condenses the lap into a round, soft rope called a sliver. It is about as thick as a man's finger. As this emerges from the machine it is conveyed into a device which coils it into a deep can called a sliver can. When full this can is carried to the drawing frame.

If a finer yarn is required the carding process is repeated. For very fine yarns the sliver is taken to

the combing machine to be combed before it is sent to the drawing frame.

Combing is required for all fine yarns such as are made from the long staple cotton, as Sea Island and Egyptian cotton.

In this process the slivers from several cans, eight or ten or even more, are united in the combing machine and at first made into a smooth lap about nine inches wide. This is passed on to the comber where the fibers are thoroughly combed, any impurities and short fibers being removed. The lap is then formed into a sliver and taken to the drawing frame as in carding. As a result of this process, the cotton is fine and silky. All short ends have been combed out, but as there is a great deal of waste, it is an expensive process and only used for the production of the very best and finest yarns, such as are required for sewing thread, fine grades of white goods, underwear, fine hosiery, and lace curtains.

In recent years there has been improvement in the combing machines so that short staple cotton may be combed.

6. *Drawing and Doubling.* A certain number of slivers from the carding machine are drawn parallel and united into one sliver by means of a series of rollers which revolve, each set faster than the one preceding so that the sliver is stretched or drawn out

continuously. In uniting several slivers in this way, weak places are strengthened and the sliver is drawn even and smooth. Just enough twist is put into the slivers to hold them together.

7. *Slubbing, Intermediate Slubbing, and Roving.* These processes consist of drawing out, twisting, and winding on bobbins. The cotton passes through these three machines in succession. They all work on the same principle but as the cotton leaves each machine it is longer, stronger, and finer until it is ready for spinning.

8. *Spinning.* In the final process of spinning the cotton roving is drawn out to the required size or fineness and twisted the right number of times for the required strength for the weaving of certain materials.

There are two methods of machine spinning:

(a) Ring spinning, which is more rapid and is used more in cotton spinning especially for warp.

(b) Mule spinning, which is the older method, more complicated and which takes up more room. It produces a softer and more elastic yarn which is especially good for hosiery. (See Figure 5.)

The kinds of yarn spun for weaving are:

(a) Warp yarns, which are hard, twisted, strong yarns made of long cotton fibers. These yarns must be strong in order to bear the strain of weaving.

(b) Weft or filling yarns which are loose, slightly twisted yarns, made of short cotton fibers. Very little strain comes on the filling yarns, consequently they need not be so strong as the warp yarns.

After it is spun, yarn is usually doubled and twisted according to the size which is required for its use and afterwards wound into skeins.

Sizes or Counts of Yarns

In the United States cotton yarns are known by numbers or counts:

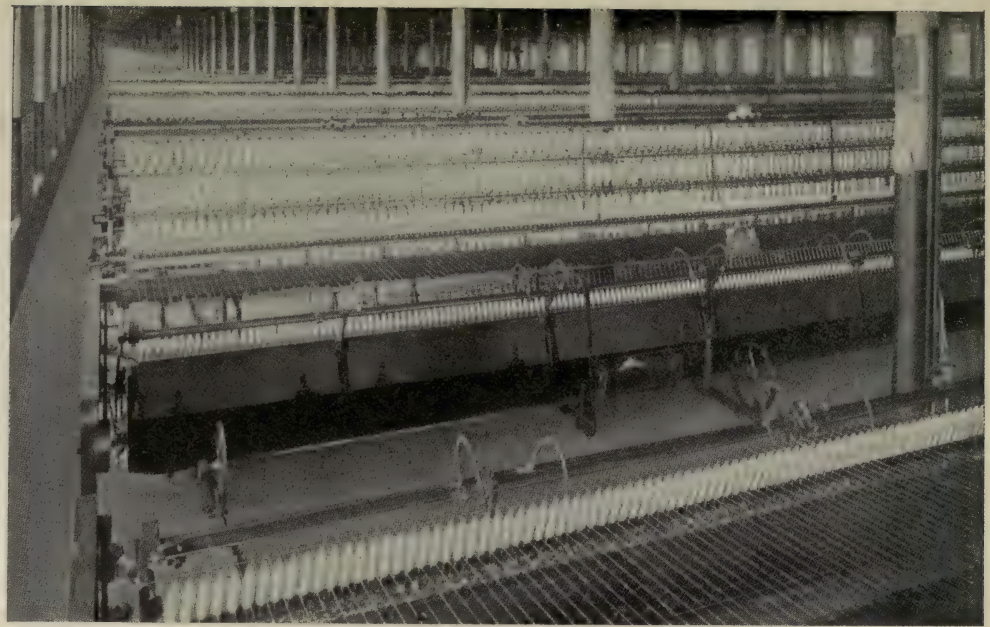
No. 1 yarn (seldom used because too coarse) has 1 skein of 840 yards to a pound.

No. 2 yarn has 2 skeins of 840 yards each to the pound.

No. 12 yarn has 12 skeins of 840 yards each to the pound.

No. 30 yarn has 30 skeins of 840 yards each to the pound, still finer, and so on.

No. 200 yarn has 200 skeins of 840 yards each to the pound. This is very fine yarn which can be made from Sea Island cotton.



Courtesy of Spool Cotton Company

Figure 5. Mule Spinners

Yarns may be single twist, 2 ply, 3 ply, etc.:

2 ply means two single-twisted yarns twisted together.

3 ply means three single-twisted yarns twisted together.

Cotton yarn is yellowish in color and may be bleached before weaving or the cloth may be woven and bleached later.

Chapter IV

WEAVING

Definition

Weaving is the making of cloth by the interlacing of two sets of threads crossing each other at right angles. Of these the lengthwise threads are called the warp while the crosswise threads are called the woof, weft, or filling. In this country the crosswise threads are usually spoken of as filling while in England they are called the weft threads.

Origin

The art of weaving can be traced to the very earliest people. The women of savage tribes used any material, such as grasses or reeds, that might be at hand, interlacing the fibers in a very crude manner to make mats, baskets, etc. At first the strips were put over and under one at a time. Then the women found that they could fasten pieces together to make longer strips.

The Primitive Loom

In the next stage the long strips of the grasses or

other materials to be woven were stretched and fastened on the ground and the cross material was carried over and under these long pieces. Next a stick was fastened to every alternate thread of warp so that these threads could be raised to allow the cross threads to go through. (See Figure 6.)

The Upright or Vertical Loom

In the upright loom the warp threads were held in an upright position by fastening them to two beams, one at the top and one at the bottom, and fastening the top beam to a tree. The alternate warp threads were fastened to a stick as in the primitive loom, so that they could be raised or lowered to form a shed as the cross threads were drawn through. This type is still used by the Navajo Indians in the weaving of the famous Navajo rugs.

The Hand Loom

The primitive looms were gradually improved to suit the needs of people wishing for finer materials and better workmanship until the hand loom was developed, which has been called the colonial loom though it was used in Europe before the colonies were settled.

This is the type upon which the power loom of the present day is based. It consisted of upright beams held together by cross beams. The different parts of the loom were fastened to these beams.

Parts of the Hand Loom

The hand loom consisted of the following parts:

The warp beam for holding the warp.

The cloth beam for winding up the cloth after it was woven.

The reed through which the warp threads passed, and which was also used as a batten to beat the weft threads together.

The heddles through an opening or eye of which the warp threads passed.

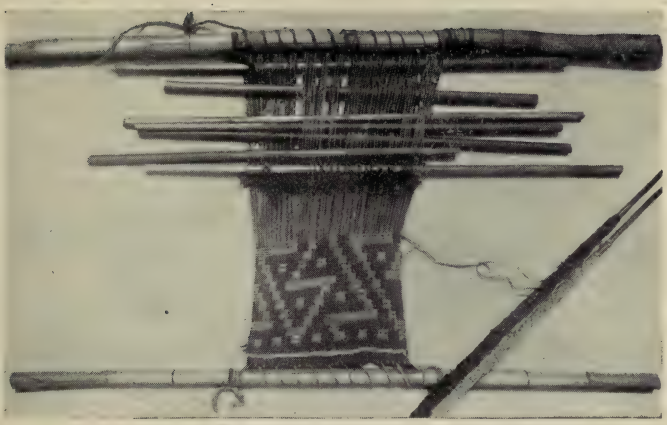
The shuttle for carrying the woof or filling thread.

The harness which consisted of two or more shafts each having a sort of framework for holding the heddles. These shafts were connected by a rope to the treadles and by this means were moved up and down to form the shed through which the shuttle passed. In weaving wide materials it required two weavers, one at each end of the loom to return the shuttle.

In machine weaving the same names are used to designate corresponding parts of the loom. Most of the inventions for the machine looms were made in the last half of the eighteenth century.

The Flying Shuttle

In 1773 John Kay, a native of Lancashire whose father was a woolen manufacturer, invented what is



Courtesy of American Museum of Natural History

Figure 6. Primitive Loom

Courtesy of York Street Flax Spinning Company

Figure 7. Damask Weaving

known as the flying shuttle. This invention consisted of two boxes, one at each side of the loom. By means of a rope the shuttle was made to pass through the sheds of alternate threads to one box and back again to the other box. In this way only one man was needed to operate the loom where two were needed before. At first this was not well received, but it was soon seen that more cloth could be woven, the price reduced, and more work done.

The First Power Loom

The first power loom was patented in 1785 by Rev. Dr. Cartwright, a clergyman of England. It is on his foundation that the perfected automatic loom of today is built. Many inventions have followed, the most wonderful of all being the Jacquard harness for the loom.

The weaving of figures in cloth was first done by using several heddles and harnesses. This sort of weaving was in process when M. Jacquard invented the loom which bears his name.

The Jacquard Loom

By means of the Jacquard loom the most intricate and beautiful patterns can be woven into the cloth. Joseph Marie Jacquard, the inventor, was born in 1752. In 1804 he brought forward his invention and met with bitter opposition, his machine was burned in

the streets but was later reconstructed with improvements.

It consists of a pierced cylinder around which a chain of cards revolves, each card pierced with holes and the total of all cards indicates the complete pattern; opposite this cylinder are horizontal needles which, as the cylinder turns, come up and strike the cards. Each needle governs a hook which, by means of an upright connecting cord, governs a certain warp thread. As the needles strike the cards, those that pass through the holes in the cards lift the hooks which lift the warp threads. The other needles striking the card where there are no holes, do not lift their hooks and the threads remain in position. When the threads are lifted by the hook the shuttle passes under and the cylinder turns again with the next card in place for the next row of threads to be lifted. In this way very beautiful and intricate designs are woven into cloth. (See Figure 7.)

The Power Loom in the United States

Steam-power for the running of the loom was not used in this country before the period from 1812 to 1820. So in the United States it is scarcely 100 years since the modern factory with the power loom was started. The industry has developed into one of the greatest of the time. Each year brings new improve-

ments and devices until the results obtained are almost marvelous.

The value of time and labor during the colonial period when everything was made by hand did not seem to be considered; the main object seemed to produce something good and durable and beautiful if possible.

Today in the department stores are found machine-made fabrics which are beautiful but most of them have not the strength or durability of the hand-made materials. The speed with which fabrics can be manufactured has enabled the production of greater quantities and a lower price has been the result, as well as greater variety of materials.

Weaving Processes

Of the two sets of threads which are used in the weaving, the warp threads which run lengthwise of the loom, are called ends, and the woof, weft, or filling threads which are put in across the warp threads, are known as picks.

1. *Preparing the Warp.* When the width of the cloth is decided upon, a certain number of warp threads or ends must be counted and put into the loom.

Before the threads are drawn into the loom they are put through a sizing process, which is a process of strengthening the cotton yarn by passing it through a

starchy or glutinous liquid. This also prevents it from becoming rough or fluffy in the loom.

2. *Threading.* The threads are wound on a large beam in the right order and then threaded and drawn in through the heddles and reed of the loom.

By means of the harness the warp threads are raised and lowered alternately forming a shed, through which the weft thread is carried by means of a shuttle which holds the bobbins and thread.

After each passage of the weft thread across the warp, the reed pushes it back tight against the preceding threads, forming a firm piece of cloth. The finished cloth is rolled up on the cloth beam. One weaver can take care of from 16 to 24 looms as they stop automatically if a thread breaks.

3. *Weaves.* Many weaves may be produced but only the simplest ones will be considered.

(a) The *plain weave* is the simple interlacing of the warp and weft threads over and under each other regularly as in muslin, percale, lawn, and nainsook.

(b) The *twill weave* is one in which weft threads may go under two or more warp threads and over two or more, each row beginning one thread in advance of the preceding row and so forming what is called the twill; as in denim, galatea, canton flannel, etc.

(c) The *satin weave* is one in which the weft threads are carried over several threads of warp, as

5 or 7, and under only one. This causes the long threads to show and the short threads to be entirely concealed. The light is reflected from these longer threads causing them to shine as in satin.

(d) The *pattern weave* is made on a Jacquard loom, as in cotton brocades and cotton damask. A float is a piece of weft thread which passes over several warp threads before it is caught down. This may be found in the satin weave where a weft thread passes over 5 or 7 warp threads and under one. It is particularly noticeable in the pattern weave where floats of different lengths make the pattern.

Inspecting

When the cloth is taken from the loom it is looked over carefully for defects such as weak places, tears, etc., and these are mended.

If the mill does none of the finishing processes, the cloth is measured, made up in bolts, wrapped in paper, and put in cases to be shipped. The value of cotton cloth depends upon the fineness of the threads and this is spoken of as so many picks and ends to the inch. "Berkely 180" means 180 picks and 180 ends to the inch. This is called the "count."

Chapter V

FINISHING

Importance of Finishing Processes

The method of finishing a cloth is often the determining factor in its manufacture, as the only difference between some materials is in the dressing and finishing after weaving.

Outline of the Processes

The following is an outline of the various methods:

1. Bleaching — cotton cloth when taken from the loom is yellowish unless the yarn has been previously bleached, and must be bleached white. This is usually done in the piece. Chloride of lime is the chemical commonly used.
2. Dyeing
   (a) Piece dyeing — solid colors.
   (b) Printing — designs stamped on, as percales, organdies, dimity.
3. Dressing
   (a) Glycerin and oils for softness, as in mull.

(b) Starch for fullness of finish, as in muslin.

(c) Mucilage and gum for gloss and stiffness, as in percaline lining and swiss.

(d) China clay for solid appearance, as in cretonne and canvas.

4. Finishes

(a) Brushing — removal of knots and other defects by emery rolls and beaters.

(b) Tentering — stretching the material crosswise to keep an even width.

(c) Beetling — beating by hammers and pressing to give a shiny surface like linen.

(d) Calendering — giving luster and smoothness by pressure under heavy rollers. This gloss is lost in laundering. Schreinerizing is also done by this process.

(e) Embossing — producing pattern effects by heated rollers. These patterns are lost in laundering.

(f) Singeing — removing the short ends by passing through red hot copper plates or Bunsen burners and water troughs. Beetling follows. Percales and calicoes are finished this way.

(g) Napping or gigging — loosening and

roughing the ends by means of cylinders covered with card clothing as in outing flannel.

(h) Mercerizing — producing a permanent silk-like gloss by chemical means.

Mercerization

Mercerization is so widely used and so important a process that more space should be given to describing it.

The materials most commonly mercerized are:

Poplin	Tussur
Lawn	Foulard
Cotton Taffeta	Sateen
Tub Silk	Silkoline
Voile	Imitation Silk Linings
Shantung	Various Upholstery Goods
	Cotton Damask

There are also many so-called silk mixed goods in which cotton yarn has been mercerized and used as silk. These are found especially in the novelty cotton goods which seem to have silk stripes. These silk-like cotton materials are often sold either in the aisles or on the counters very near the silk goods section.

Discovery of Mercerization

The permanent gloss which is found on these cotton materials is made by a process discovered by John Mercer, for whom the process is named, in 1844, and

patented in 1850. He found that by immersing cotton goods in caustic soda, the cotton fiber, which under the microscope is flat and ribbon-like, swelled until it was round and tube-like, and then contracted or shrank in length making it stronger. It was found that such cotton also took dyes more easily than the ordinary cotton. (See Figure 8.)

Little was done with this discovery until 1889, when in experimenting with this process, the goods were stretched to prevent shrinking. When the caustic soda was washed out a gloss appeared which was found to be permanent. As chemicals were cheaper than when the process was first discovered, mercerized cotton began to be put on the market, with the result that it has gained in popularity, and is now used to a great extent. It has given to cotton fabrics a much wider use than before and is, therefore, a most important discovery.

Process of Mercerization

The long-fibered cotton, Sea Island or Egyptian, is used because it will stand more strain than the shorter fibers.

The yarn or cloth is first washed, rinsed, and dried. It is then put in the caustic soda and left for ten or fifteen minutes. Then it is removed and stretched to its original length. The material may be passed

through the caustic soda solution on rollers which keep it stretched. While still under tension it is washed in water to which a chemical has been added, usually sulphuric acid. This counteracts any harm the caustic soda might do the material. The material is then bleached, although the bleaching may be done before mercerizing.

It is finished by dyeing, singeing, and calendering. Sometimes the yarns are gassed to remove the ends of the fibers before being mercerized.

Mercerization not only gives a silk-like appearance to cotton goods, but makes the goods stronger through the swelling and contraction of the fibers. Therefore, mercerized materials may be recommended for their strength and durability. They wear well and look well, but should not be passed off as silk.

Difference Between Mercerization and Calendering

Calendering or schreinerizing should not be confused with mercerizing, as by these processes the gloss formed is not permanent, but will be lost in the first laundering. Schreinerizing is a calendering process. The cloth is passed under rollers engraved with fine lines. The threads are pressed flat and the lines appearing on the surface reflect the light, giving the high luster.

Chapter VI

MIXTURES, ADULTERATIONS, IMITATIONS, AND TESTS FOR COTTON

Mixtures

Cotton may be mixed with other materials to produce mixed or fancy effects. These mixtures may be: cotton and linen, cotton and wool, cotton and silk, cotton and artificial silk or fiber silk, or cotton and mercerized cotton. Many attractive cotton fabrics with silk stripes and figures are made by combining cotton with artificial silk, mercerized cotton, and sometimes weak, spun silk.

Adulterations

Adulterations have been the result of the demand for a low-priced article, and competition has been so keen among the manufacturers that they have tried to make poor material look like good material. They also have given their goods names which would lead the public to think they were made from a better material.

Cotton, although the cheapest fiber, may be adulter-

ated and further cheapened by sizings, such as starch, glue, gum, and china clay, which are put in to strengthen the fiber. The sizing washes out, leaving a poor, loosely woven, thin material.

Imitations

Cotton has an extraordinary capacity for imitation so that it can be made to look like all the other fibers. For instance, there are cotton tweeds and cotton cashmeres, cotton voiles and cotton challis, cotton poplins and cotton pongees, and many other imitations. Many of these materials are very attractive and serve their purpose well, but customers are becoming more and more interested in the exact quality that they are buying.

If salespeople know these imitations and can speak intelligently about the materials of which their stock is made, showing the advantage of each for the purpose required, buyers will learn to trust their judgment as well as their honesty. If people understand that they are getting imitation goods for a lower price than that for which the real article could be sold, they will not expect them to wear so well as the more expensive materials.

Imitations of Linen

Cotton is made to imitate linen by the calendering process whereby a gloss is put on which will not re-

main after washing. Plain cotton is made to imitate mercerized cotton by the calendering process.

Imitations of Silk

Silk effects are produced by using silk patterns of which taffeta silk is an example. The lustrous satin finish is given to the cotton sateens by using a dressing of glycerine and passing the material through heated rollers under pressure. This is the calender finish. Mercerized cotton ever since its discovery has been used to imitate silk, and when woven in a silk pattern strongly resembles spun silk.

Embossed patterns are sometimes made to imitate brocades. These patterns are made by machines, after the cloth is woven. As the nap around the pattern is simply pressed flat with a little dressing to hold it down, the dressing and gloss will disappear if laundered.

Imitations of Wool

It is made to look like wool in various ways. Sometimes patterns which are usually seen only in wool are used. Sometimes the fibers are chemically treated so that they resemble wool. The imitation of wool with which we are most familiar is the napping process. By this process the loosely woven cotton material passes between rollers covered with small teeth or wires which scratch the surface of the cloth,

giving it a rough appearance like wool. Examples of this are outing flannel, flannelette, blankets, and others.

Names of Imitation Goods

Misleading names for cotton materials are:

Flaxon	Sateen
Linon	Velveteen
Linene	Outing Flannel
Near-Silk	Flannelette
Silkaline	

Tests for Cotton Materials

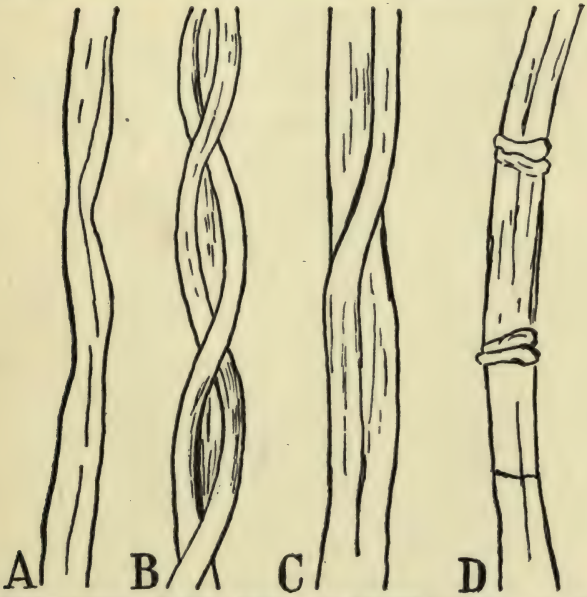
There are some very simple tests which can be made for cotton. These are:

1. For heavy sizings:
   (a) Hold the cloth to the light and look through to see if the sizing can be seen in the meshes.
   (b) Rub the cloth between the hands and a white powder will come off if it is heavily sized.
   (c) Boil a sample to remove the sizing and notice the quality of the material afterwards.
2. To test the cloth for strength, press the thumbs against it. If it is weak it will break easily.
3. The calendered or glossy finish used in imita-

tion of linen or mercerized cotton will disappear if a sample is washed.

Cotton Under the Microscope

Each fiber has its own characteristic structure, which will show plainly under the microscope. Therefore, the fibers of which materials are composed may be detected in this way.



A—Unripe Cotton. B—Ripe Cotton. C—Mercerized Cotton. D—Flax.

Figure 8. Cotton and Flax Fibers Under the Microscope

The ripe cotton fiber under a microscope looks like a flat ribbon with a ridge at each side and is twisted several times. This twist helps in the spinning, for the fibers twist around each other, adding to their strength. In good fibers the twist is rather uniform and strong. Unripe cotton fibers have very little twist and do not take the dye well.

Mercerized cotton fibers have a cylindrical, smooth, and stretched appearance. There is usually no twist, but occasionally a slight one may be detected. (See Figure 8.)

Chapter VII

COLOR AND DESIGN IN COTTON FABRICS

Importance of Color Arrangement

Color is important in the display of goods, in making an appeal to the customer and in its relation to the store as a whole.

In showing goods a salesperson may spoil a sale by placing inharmonious colors near each other. This should always be considered in displaying goods on the counter. For instance, if bright colors and also quieter colors are to be shown, the bright colors should not all be placed together, but the quieter ones should be placed between.

A person intending to stop and look at goods for the purpose of buying may almost unconsciously pass by a counter where color combinations hurt the eye. Most people are sensitive to color, many without realizing it. A person may be especially attracted to a counter where goods are arranged in pleasing combinations and although not intending to buy, may become a customer at once.

Effect of Colors Upon Each Other

Two colors that are pleasing in themselves may be injured by being put next to each other; each borrows an effect or value from the other. If red and blue are put next to each other, the blue will appear greenish, while red will turn more orange. Black makes any other color look darker and white makes the color brighter.

Saleswomen should be able to assist in matching colors and also in selecting the color suitable for different people. This requires a study of the effect of color on the complexion.

The use for which materials are intended makes some difference in the choice of the color, bright colors being more attractive in the house than on the street.

Warm colors are those suggested by sun and fire, as red, orange, yellow; cool colors are those suggested by sky and grass, as green, blue, violet.

A knowledge of color and design is valuable in every department, but its importance is greatest in the Silk Department. Therefore, a much fuller treatment of the subject will be given in that manual and only a brief outline here.

Effect of Artificial Light on Colors

In artificial light, colors change, i.e.,

Purples and violets appear brown.

Yellow, orange, and red are brightened and enriched.

Green appears yellower and darker.

Blue is less pure and darker.

Color Combinations

There are certain safe guides to good color combinations:

1. From science. (Color wheel harmonies— See manual for "Silk Department.")
2. In nature — as birds, butterflies, flowers.
3. In pictures — Japanese prints, reproductions of masterpieces, etc.
4. In good textiles — as seen in museums.

Many of the bright colors are found at the lining counters as these materials are used on the inside of a garment where only an occasional glimpse may be seen. Sometimes these bright colored linings are not as desirable as a gray or quiet color, because if worn next to white the color may come off. Effective contrasts of color are often desired in linings.

Reproducing the Design

Designs in cotton materials are produced by two methods, weaving and printing. Woven patterns often increase the cost of the material.

When the cloth is woven, the pattern, whether a

figure, stripe, or plaid, may be woven into the cloth at the same time. The pattern may be of the same color as the background of the fabric, or it may be of various colors, each woven into its proper place. Ginghams are a good example of this method.

The pattern may be printed or stamped on the cloth in one or in many colors. This method is used for reproducing the flowered patterns of dimities, percales, and challis. Sometimes material is found where both methods have been used on one piece.

Other Effects

A lengthwise cord effect may be produced by using a thick warp yarn at regular intervals.

A crosswise fine rep may be produced by using a thick and heavy weft and a thin warp.

A variety of patterns may be produced by using a yarn different from the yarn forming the main part of the cloth; for example, by using a mercerized cotton or artificial silk with a regular cotton yarn.

Striped and plaid materials are made from yarn which has been dyed before it is woven. Thus different colors of yarn may be placed side by side in the warp, and the weft may be all one plain color, in which case a stripe is formed. The weft may be of colors the same as the warp and put in in such a way as to form a plaid.

The designer must know the fashions of the season to follow and make his designs accordingly. Sometimes stripes may be the prevailing fashion and another season plaids; also fashion may demand small patterns or large patterns.

Chapter VIII

DYES AND DYEING

Origin

Many of the dyes used in coloring textiles have been known and used for centuries. Long ago people realized that they could extract coloring matter from certain plants, small animals, or minerals, and use this coloring substance as a dye for their textile materials. These dyes are called natural dyes. However, during the last fifty or sixty years a wonderful discovery and development has been made in the so-called artificial or coal tar dyes, which are chemical compounds.

Natural Dyes

As the name implies, the natural dyes are those which are obtained from nature either from animals, plants, or minerals.

The natural dyes are the older and have been used from the most ancient times until the middle of the last century when the artificial dyes were discovered. A few of these natural dyes are still used to some

extent but most of them have been replaced by artificial dyes.

The natural dyes may be classified as animal, vegetable, and mineral.

Animal Dyes

The animal dyes are prepared from insects, etc., such as:

Cochineal, a bright red dye, which is obtained from the dried bodies of small insects.

Lac, a scarlet or crimson dye, which is also obtained from the bodies of small insects.

Tyrian purple, which was obtained from the body of a small shell fish in quantities of two or three drops.

Vegetable Dyes

The dyes made from vegetables include:

Logwood, which is used principally for black silk. This is extracted from the wood of a West Indian and Central American tree.

Indigo, which is obtained from the juice of a plant, coming originally from India. This juice is yellow when fresh but turns blue upon exposure to the light and air.

Madder, which is used in the process of making

Turkey red dye. It is obtained from the root of the plant.

Fustic, which is a yellow dyestuff. This is extracted from the wood of a tree.

Cutch, which is a brown dye. This is obtained from the leaves, seeds, pods, and nuts of the acacia tree.

Mineral Dyes

There are a great many combinations of metallic salts for making colors, such as:

Iron buff, which is a solution of salts of iron used in the present day in the dyeing of khaki cloth.

Prussian blue, which has copperas and potassium ferro-cyanide as a basis, used as a substitute for the more expensive indigo.

Chrome yellow, made of lead acetate and potassium bichromate.

Artificial or Aniline Dyes

Artificial dyes were discovered by an English chemist, W. H. Perkin, in 1856, and the discovery has completely revolutionized the art of dyeing.

These dyes are known also as coal tar dyes because obtained indirectly from coal tar, a thick, oily, black product left from the manufacture of coal gas. For

many years this substance was hard to get rid of, as there was no use for it. Now it is a valuable product and is used not only for dyeing, but for the production of medicines, perfumes, flavoring extracts, and so on.

In the distillation of coal tar a great many different products are obtained; one of these is called aniline and it was while experimenting with aniline that the first dye was discovered. This was called mauve, and since then hundreds of colors have been obtained which are known as aniline dyes.

Thus far Germany has led the world in the production of artificial dyes and the industry employs many chemists who are constantly discovering new colors.

Direct Cotton Dyes (Substantive Dyes)

It was not until 1884 that a dye was discovered which would dye cotton directly. This was known as Congo red. After this, many other colors appeared. The dye is dissolved in water and brought to a certain temperature. Common salt is usually put into the bath, the cotton is immersed for a short time, then taken out and rinsed, and then, in order that the color shall be fast, it may be necessary to put the material through other chemical solutions such as aluminum, copper, or chromium salts. "Diamond Dyes" belong to this class.

Sulphur Dyes

These also dye cotton directly; that is, without the use of a mordant and are especially good in the darker colors. With many sulphur colors, an after treatment with a metallic salt is necessary. They are fast to light, washing, and perspiration and therefore they are good for hosiery and knit goods in black and dark colors.

Mordant Dyeing

Until the discovery of the direct cotton dyes, all cotton materials had to be treated with a mordant before dyeing, because without such treatment the dye would not unite with the cotton fiber.

A mordant or fixing bath is a chemical which unites with both the cotton fiber and the dye so that the color becomes fixed or fast in the material. Usually the cotton goods is first immersed in a mordant bath and dried, and then immersed in the dye. Sometimes the mordant can be put into the dye bath in which case only one process is necessary.

The mordant process is preferred to other processes for some colors and some materials as the colors are more fast.

Vat Dyes

These dyes are especially fast to light and washing.

They are so called because of a special preparation which is made in the dyeing vats before putting in the cloth. The coloring matter in certain dyes is insoluble in water, consequently, a chemical must be used which will form a new compound that is soluble in water. This new compound is either colorless or yellow. The cloth is put into the solution, worked up and down for the solution to penetrate, and is then washed and hung so that the air will reach every part of it. The color appears on the material as the compound on the fiber comes in contact with the oxygen of the air and is oxidized.

Methods of Dyeing

Raw Cotton. This is sometimes, but not often, dyed before it is spun.

Yarn Dyeing. Striped and plaid materials, as ginghams, madras, etc., are made from yarn which has been dyed before it is woven.

Piece Dyeing. The woven cloth may be dyed in the piece. Cloth which is all one color is usually piece-dyed. This is the cheapest method as it is done by machinery. It may be done by simply preparing the dye bath and when the proper temperature is reached the goods may be run into the bath where they are kept in constant motion by means of rollers, and then passed to the rinsing box. Most of the plain

cotton materials, as sateens, denims, muslins, velveteens, etc., are piece-dyed.

The Dyeing Process

The material is first washed to remove any oil and coloring matter that may be present. As cotton cloth is of a yellowish tinge it must be bleached if light colors are desired, but for dark colors this is not necessary.

Before dyeing, the material must be thoroughly and evenly wet. In the dye vat it must be kept in constant motion that the dye may penetrate evenly. The longer it is allowed to stay in the dye the deeper will be the color.

Upon removal from the dye vat, it is plunged into cold water to remove the loose dye, and it is then dried.

Printing

Designs or patterns which are not woven into the cloth are printed on the surface. Examples of printed cotton goods are:

Calico	Flannelette
Challis	Lawn
Chintz	Muslin
Crêpe	Organdy
Dimity	Percale

Cotton materials are usually printed in the piece, but in goods which have a rainbow effect, the yarn is printed at intervals with different colors before weaving.

In the manufacture of cotton cloth one manufacturer often spins the yarn and makes the cloth, which in turn is sold as print cloth to another manufacturer, who finishes and prints it, whereupon it is bought by the jobbers and retailers. There are other manufacturers who spin the yarn, weave the cloth, finish it, print it, and sell it direct to the retailer.

Block Printing

Cloth was first printed by means of wooden blocks and this process is still used to some extent. These blocks are square pieces of wood of various sizes according to the pattern which is to be made on them. The pattern or design is traced on the wood and then the wood around the design is cut away leaving it standing out, like the letters on a rubber stamp.

A pad is saturated with the required color. The wood block design is pressed against the pad until the color is taken up. The block is then placed on the cotton cloth, and a blow from a mallet impresses the pattern on the cloth.

This process is repeated until the whole surface of the cloth has been covered. It is an expensive process

because of the time which is required in printing.

Machine Printing

The work of printing can be accomplished in much less time now by machines in such ways as:

1. Direct printing
2. Discharge
3. Resist

Direct Printing

By this method the cloth is passed between polished copper rollers, $3\frac{1}{2}$ feet wide and 6 inches in diameter, on which the design or pattern is engraved over the entire surface. If different colors are required there is a roller for each color that is in the pattern.

The cloth is first singed or gassed to remove the short fibers, and frequently it is bleached, especially if a white material is to be printed.

The cloth then passes over a central roller or heated drum around which the engraved rollers are fastened.

The cloth comes in contact with each roller in turn. Each roller has its own design and comes in contact with its own color, which is in a trough just below the roller, impressing it upon the cloth. A strip of steel called the doctor removes the color from all parts of the roller except the design.

Sometimes a mordant is required to fix some part

of the design. The dye may be mixed with a powerful mordant but the colors are not so fast as when mordanted afterwards.

Discharge

Another method of printing is by discharge. In this method color is removed by a chemical from goods which has been already dyed in the piece, thus leaving a white pattern, which may be printed over again in another color if desired.

Copper rollers with engraved designs are also used, but they come in contact with chemicals instead of dyes, removing the color as the cloth passes between them.

Sometimes the chemical used in printing the pattern is too strong and weakens the cloth. For instance, polka dots in cheap goods have been known to drop out entirely before the cloth was worn out.

Resist

In this method a chemical is stamped on a plain white cloth and the cloth afterwards dyed. The dye has no effect on the pattern which has the chemical on it, while the rest of the cloth will be dyed.

Thickened Dyes

Practically the same dyes are used in printing as

in dyeing, except that in printing the dye must be thickened as it is used in the form of a paste instead of a liquid. The materials used in thickening are starch, gum arabic, gum tragacanth, and dextrin.

Chapter IX

COTTON FABRICS

Classification

Only the staple fabrics are mentioned in the list below. There are many fancy materials with trade names which appear each year but as these are constantly changing it seems best to consider only the fabrics which are always to be found on the shelves.

Batiste

This is named from the inventor, Jean Baptiste, a French linen weaver. Batiste was originally a linen fabric, fine and sheer, either plain or printed. It is now usually woven of a fine quality of cotton yarn in different grades of material. It is used for dresses and fine underwear, and the coarser grades are used for linings.

Calico

The name comes from Calicut, India, where it was first printed. It is a coarse, cheap, cotton fabric printed with a design on one side only. As it is cheap,

the colors are often not fast and fade when laundered. It is used for wrappers, morning dresses, shirt waists, and aprons.

Cambric

This was first made in Cambrai, France, from which it receives its name. It was originally made of fine linen threads and was imitated in cotton by the Scotch people who called it cambric muslin. It is woven of fine cotton yarns and carefully finished by bleaching and calendering. It is used for infants' dresses and underwear. One make is named Berkeley cambric.

Canton Flannel

This is so called from Canton, China, because it was first imported into England from China. It is also called cotton flannel. It is made of soft twisted yarns woven with a twill weave and has a nap raised on one side. It is finished as unbleached or bleached canton flannel and is dyed in plain colors. It may be used for winter undergarments white or unbleached. When dyed it may be used for interlinings or draperies.

Challis

This is an inexpensive cotton fabric of plain weave and printed pattern. It varies considerably in quality and price. A cheap, rather coarse grade is used for

covers for comfortables, kimonos, etc., while the better qualities are used for dresses and dressing sacques.

Chambray

The name also comes from Cambrai, the French city, where the material was originally made of linen yarn. It is a plain gingham with a colored warp and white weft or filling, which gives a blended or softened effect. It is woven with a plain weave of finer yarns. In the finishing it is stiffened with starch and then calendered. It is used for dresses, aprons, shirtings, etc.

Cheese-Cloth

This was originally used for covering cheese. It is a cheap, thin fabric, either bleached or unbleached. It is used for cheap, fancy dresses when a draped effect is wanted; it dyes easily, drapes nicely for decorations, and is unsurpassed for cheapness and pleasing effect.

Corduroy

The name is derived from the French *corde-du-roi,* meaning a king's cord. The material was first made in France in the seventeenth century, for the king's huntsmen. At the present time it is made principally in England.

Corduroy is a cotton fabric made by pile weaving,

the pile being in the weft or filling. Sometimes only one weft, making both the pile and the foundation weave, is used. For the better grades two wefts are used. One is thrown up, forming loops for the pile, where the cords are to appear; the other is for the foundation weave only, and is used both for the cords and the furrows between. If the loops in the center of the cord are longer than those at the sides a rounded effect is given the cord. After weaving, the loops are cut on a special machine. The material is then sheared and singed for a smooth surface and dyed in the piece. The width is about 27 inches.

Corduroy is used for women's skirts and suits and for boys' and men's suits and trousers when rough and hard wear is required. It is also used for upholstery.

Crêpe or Crêpon

These are fine muslins with a crinkled effect, which is produced by an adaptation of the mercerization process. Some of the yarns used in weaving are coated with gum or gelatin while others are not. After weaving the cloth is treated with caustic soda which has no effect on the coated yarns but the unprotected ones, usually the weft, shrink, crinkling the cloth. It is used for dresses, fancy aprons, children's clothes, etc.

Damask (Cotton)

This is a cheap fabric woven to imitate linen damask. It is used in the same way as linen damask for table cloths, napkins, towels, etc.

Denim

Denim is a heavy material with a twill weave, dyed in plain colors or with stripes and checks. It is used for men's overalls, jumpers, and blouses. Art denim, a finer and better quality, is used for petticoats, furniture coverings, sofa cushions, draperies, and decorative purposes.

Dimity

Dimity is a fine cotton fabric characterized by small cords running lengthwise of the material, with the warp.

Drilling

(See Linings.)

Duck (Cotton)

Duck is a stout, heavy material made in different weights, finished as bleached or unbleached and either dyed or printed. It has a plain weave but two threads of the warp are laid close together and treated as one in the weaving. The width is usually from 28 inches to 30 inches.

It is used for women's suits, men's trousers, etc. The dark colored material is used for overalls and jumpers. In fancy stripes it is used for awnings and in lighter weight for women's skirts and suits.

Flannelette

This is a cotton fabric having a slight nap on one side. In the weaving, a soft, loose thread is used for the filling in order that the nap may be easily raised as the teeth of the napping rollers pass over it. The colors and patterns are printed on the material. It is used for wrappers, kimonos, etc.

Galatea

Galatea is a strong, firm, heavy fabric with a satin or a twill weave. It is dyed in plain colors or it may have printed patterns. It is used for middy blouses, skirts, children's dresses, etc.

Gingham

The name comes from Guingamp, France, where it was first manufactured. The material was originally brought to Europe from India. It is a fabric with a plain weave made in stripes, plaids, or checks of two or more colors. The yarn is dyed before weaving. A wide range of materials is sold under this head from the checked apron ginghams made of coarse yarns, to the better goods made of fine yarns in most artistic

colorings and designs. It is used for dresses for women and children and in the coarser grades for aprons.

Huckaback (Cotton)

The word huckaback comes from huckster and back. The huckster or pedler is a man who carries his wares on his back. It is a coarse material made of soft twisted cotton yarns. It is finished to look like linen huckaback and closely resembles the coarsest weave of the linen material. In width it ranges from 18 to 27 inches. It is used for coarse toweling.

India Linen

This is a fine, bleached cotton lawn having considerable dressing in the finish. The width is from 30 to 36 inches. It sometimes comes in colors. It is used for summer dresses, and for infants' and children's wear.

Indian Head

This name is given to a cheap, heavy, white fabric which wears well, looks well, and launders well. It is used for skirts and dresses.

Jaconet

This is a thin, soft variety of muslin somewhat heavier than cambric. It is a full-bleached cotton

with a plain weave. It is made with both a hard and a soft finish. The hard finish is obtained by first mangling and then sizing with pure corn-starch after which the fabric is glossed by passing it twice through the calendering machine. The soft finish is produced similarly except that less starch is used and the goods are calendered only once. This material is used for summer dresses, for infants' and children's wear, etc.

Khaki

The name comes from the Hindoo word meaning dust or clay colored. It is a variety of cotton drilling dyed clay-color or a yellowish-brown. It is a strong material made from long staple cotton and woven with double and twist twill. It is finished by a secret process which renders it water-proof. It shrinks little in laundering and requires no starch. The process was invented by an Englishman named Lehman. It was first used in India by the English regiments in 1875 and in this country during the Spanish-American War in 1898. It is manufactured in England and also in the United States and is now used by both the United States Army and Navy. The government requires that the best American cotton be used, that the material shall have no singeing but shall be soft, smooth, and water-proof and that the weave be a twill

with not less than 32 twills to the inch. It is used also for skirts and suits.

Lawn

The name comes from the town of Laon, France. One authority contends that it received its name from the cloth's being put on the lawn to dry instead of the coarse grass. It is a thin, sheer cotton fabric in plain weave, lace stripes, or open work effects. It may be printed in floral patterns, stripes or plaids, or it may be dyed in plain colors in which form it is often used as a lining under thin white materials. It is used for dresses, aprons, and underwear. The varieties of lawn include: Persian, linen, Victoria, and printed lawn.

Linon

This is a fine, plain-woven firm fabric made of cotton yarns but treated so as to resemble linen. It is a good wearing material.

Long Cloth

The name is supposed to come from the fact that originally only long, staple cotton was used. It is a fine, soft, bleached material usually made of a good grade of cotton fiber. It is woven 36 inches wide and usually comes in 12-yard pieces. It is used almost entirely for undergarments for women and children.

Madras

The name comes from Madras, India, where it was first made. Madras gingham is a white, cotton fabric ornamented by stripes, both white and colored. The colored stripes are usually printed on the material. It is used for women's waists and men's shirtings.

Marquisette

This is a fine, sheer fabric made with a plain weave and an open mesh. It is used for dresses.

Mull

The name is from the Hindoo *mal* which means soft. It is a soft, thin, sheer, and semitransparent fabric. It is sometimes dyed in light colors, but it is usually full-bleached. It is used for millinery, as it shirs nicely on account of its softness. Swiss mull is the same material, finished with a stiffening.

Mosquito Netting

This is a coarse, thin, transparent material. It is commonly woven with a single threaded warp, and a weft of two loosely twisted strands of thread. It is dyed in all colors and comes in bundles of 12 pieces which together amount to 100 yards. It is used for screens, for canopies for beds, children's carriages, cribs, etc., as a protection from flies and mosquitoes.

Tarletan is the same kind of material with finer meshes.

Muslin

The name comes from Mosul, a city in Asia, which produces muslins of greatest beauty. It is a general term for plain-woven cotton cloth. It may be coarse or fine, bleached, unbleached, or half-bleached. It is used for underwear, sheeting, etc.

Nainsook

The term is derived from the Hindoo *nainsukh*. It is a thin, fine, white cotton material of plain weave. It is used principally for undergarments and infants' wear.

Organdy

Organdy is a thin, semitransparent material known by its stiffness or crispness and bright, clear finish. The material never looks well after laundering. It is a plain weave material, although sometimes stripes or checks may be woven in. It is also printed with delicate designs and sometimes dyed in plain light colors. It is used for dresses and is especially attractive over colored slips for evening or for bridesmaid dresses.

Osnaburg

The name comes from Osnabruck in Hanover where

it was first made as a coarse linen material. The name as now used applies to a coarse cotton sheeting in imitation of linen. The goods were originally made in plain colors only, then stripes, plaids, and checks were introduced.

Most of these sheetings are woven in the southern mills. No finishing processes are required after weaving except calendering, although some of the finer grades have a slight dressing. The sheetings are folded in yard lengths, then doubled over in three folds and secured by strings at the edges like muslin and other domestics. They are packed in burlaps and hooped with iron. The higher grades, woven of finer yarns and slightly dressed, are rolled on boards and ornamented with paper bands. These are packed in cases instead of bales. It is used for sheeting.

Outing Flannel

This is a cotton fabric having a nap on both sides. It is woven with a soft loose thread and the nap is raised by passing between cylinders covered with card clothing. It is used for nightgowns, petticoats, infants' wear, etc.

Percale

This is a firmly woven fabric containing considerable dressing but not much gloss. It is made in different qualities, some of the cheaper qualities being

practically the same as calico. It is usually known by its printed figures and printed stripes and plaids, but it also is sold in plain white or colors. It is from 28 to 36 inches in width. It is used for dresses, shirt waists, wrappers, aprons, children's dresses, and men's and boys' shirts.

Piqué

Piqué is a heavy corded or figured cotton fabric, the cords usually extending across the cloth from selvage to selvage. It comes only in white. A lighter weight quality with lighter cords is sometimes figured or printed. It is used for skirts, dresses, children's coats, collars and cuffs, vests, etc.

Poplin

This is a fabric having a fine cord across the cloth, the cord being produced by a fine warp thread and a soft, heavier filling thread. It is used for dresses, waists, and skirts.

Ratine

This is a fabric woven with small tufts on the surface with spaces between or with loops, as in terry weaving (see "Terry Cloth," below). It is used for dresses and skirts.

Shirting

Shirting is a general term for fabrics which are

especially suitable for shirts. It may be plain bleached muslin which comes 36 inches wide, but more often it is a strong cotton material with printed or woven patterns in stripes.

Swiss

The term comes from Switzerland where it was first manufactured. It is a thin, pure white, semitransparent muslin having considerable dressing in the finish. It is woven plain or with dots or patterns at regular intervals. It is used for dresses, aprons, etc.

Tarlatan

This is a thin, transparent muslin finished with considerable dressing. It is rather coarse in quality, with a plain weave. It comes 54 inches wide in white and cream color and is also piece-dyed. It is used for children's dresses, window screens, and fancy work.

Terry Cloth

This is a coarse, rough cotton fabric which has a looped pile surface made with two sets of warp threads, one called the ground warp and the other the pile or terry warp, which is used to form the loops. These warp threads are wound on separate beams. The ground warp is kept at a regular tension all the time, while the pile warp is arranged so that it can be made slack to form the loops. After leaving the loom there

is practically no finishing process for the cloth. This process was invented by Samuel Holt of England in 1848. In 1864 he left London and began the manufacture of the cloth in Paterson, New Jersey. It is used for bath towels, bath robes, and wash cloths.

Ticking

Ticking is a strong material with a twill weave having lengthwise colored stripes of blue, red, brown, etc. The width ranges from 27 to 60 inches. The standard width of bed ticking is 36 inches.

The cheap grades are used mostly for bed ticking, mattresses, and pillows. The better grades are made of fine yarns woven with a satin twill. Harmonious colors and the satin luster of the surface make a material suitable for many purposes besides mattresses and pillows, such as fancy work, fancy aprons, bags, shirts.

Tucking

Tucking is fine, white cotton goods of lawn, muslin, or cambric, with rows of tucks stitched across, either close together over the entire surface or in clusters. It is used for skirts, underwear, waists, yokes, trimming, etc.

Velveteen

The name comes from the Italian *velluto di cotone.*

It is a cotton fabric made in imitation of velvet. It is usually heavier and wider than velvet. Velveteen was first manufactured in England about the last of the sixteenth century and has never been made to any extent in the United States. It is manufactured principally in Manchester, England, and in Crefeld, Barmen, and Elberfeld, Germany.

Velveteen is woven by means of one warp thread and two weft or filling threads, whereas velvet is woven by means of two warp threads and one filling thread. In the weaving of velveteen one weft thread is used in forming the pile which is made with a float or satin weave, while the other weft thread forms with the warp either a plain or a twill weave and binds the pile weft in tightly so that when this pile thread is cut later it may be brushed, dressed, and sheared to give the appearance of velvet. It is dyed after this. It is used for dresses, suits, and hats.

Voile

This is a semitransparent fabric made with a plain, somewhat open weave. It may be plain, striped, or figured.

Chapter X

THE LINING COUNTER

Attractiveness of Linings

In passing the lining counter one is attracted by the display, which rivals the Silk Department in its profusion of printed silk design.

The mercerization of cotton has made possible the marketing of these silk-like materials which indeed wear better than ordinary lining silk. Owing to the high cost of silk only an inferior grade is used for linings, so that the finer mercerized linings which look and feel like silk have to a great extent replaced the genuine article.

Varieties of Linings

Linings for men's garments are serge, silesia, farmer's satin, light-weight silks, and satins.

Linings for women's garments are cambric, drilling, percaline, silesia, sateen, silk, and various mercerized materials.

Buckram

This is named from city of Bokhara, Tartary, where

it was first made. It is a coarse, very stiff material usually linen but sometimes cotton, heavily sized with glue or gum. It is used as a stiffening to keep certain parts of a garment in shape.

Cambric

Cambric is a cheap, thin, cotton material, both dull and glaze finished. The latter, called paper cambric, is often sold from rolls. Cambric is dyed in plain colors. It was formerly used for lining skirts. It may be used as a lining for any heavier material where the lining does not show.

Canvas

Canvas is named from the Latin *cannabis,* meaning literally "a hempen cloth." It is a heavy, thick, unbleached cloth of plain weave and may be either linen or cotton. When used for linings it is stiffened with gum. It is used as a stiffening for coats, collars, etc., the poorer grades being utilized for package coverings, ship sails, mail bags, etc.

Crinoline

This is a coarse, cotton material, made stiff by a heavy sizing. It was originally made of horse hair and linen and was then used for stiffening skirts to make them stand out. Its present use is for inter-

linings of collars, cuffs, etc., where only a little stiffness is needed.

Drilling

Drilling is a stout cotton material with a twill weave. It may be bleached, unbleached, or dyed in plain colors. It is used for dress linings, and for pockets and linings in men's clothing.

Farmer's Satin

Farmer's satin is also called Italian cloth. It is made of cotton or more often of cotton warp and wool filling. It is woven with a satin weave and finished with a luster to resemble satin. It is dyed in plain colors and in black. It is used chiefly as a lining material for men's coats and vests, and to some extent for women's petticoats.

Interlining

This is a layer of material placed between the outside cloth and the lining proper, to give added warmth to the garment, or as a stiffening to preserve the shape. For warmth, cotton flannel is sometimes used for wadding. For stiffening, crinoline, buckram, canvas, wigan, or haircloth may be used.

Percaline

This is a lining material of fine, light weight. It

is dyed in plain and fancy colors and finished with a gloss and watered effect. It is 36 inches wide and double folded; that is, folded in the middle with the edges together. It is used as a lining for waists and dresses.

Quilted Lining

Quilted lining is a heavy lining, composed of a layer of cotton wadding between two pieces of thin material, the three being held together by quilting stitches. Silk and satin are used for the outer material in the better grades, sateen in the cheaper grades. It is used as a lining for winter wraps and coats.

Sateen

This is a fine cotton fabric known by its glossy satin-like finish and softness. It has a close twill weave and is bleached white, dyed in plain colors, or printed with figures. It comes in various widths and qualities. Its principal use is for linings, but when printed with figures to resemble silk it is used for dresses.

Silesia

The name comes from Silesia, a province of Prussia, where it was first made. It is a thin, closely woven cotton fabric with a twill weave, finished with a glazed surface in black, white, and plain colors. It is used for linings.

Wadding

Wadding is a thin sheet of carded wool or cotton. The term has been in common use since the seventeenth century. Cotton wadding is a sheet of raw cotton similar to batting, only much thinner, with glazed outer surfaces. Usually it is 32 x 36 inches and comes in white and various colors, slate, blue, green, yellow, etc. It is used for interlinings of all kinds, for stuffing out to give a rounded effect, and for quilting into linings.

Wigan

Wigan is named after the town of Wigan in England. It is a very stiff and open cotton material usually dyed in dull shades of drab, gray, and black. It is 32 inches wide. A few years ago it was used extensively for stiffening the bottoms of dresses.

Chapter XI

HISTORY AND CENTERS OF COTTON INDUSTRY

History of Cotton

It cannot be definitely stated when cotton was first used for clothing. Cotton was known and used in Egypt 2,000 years ago. It was grown in India and manufactured into cloth at a very early date. The first record we have of it is about 800 B. C. but it was then already a well-developed industry. The Greeks and Romans used cotton, but only for garments of luxury.

It is said that cotton was first cultivated in China as a garden plant and it was not until the thirteenth century that cloth was manufactured there.

India continued to manufacture the best cotton material, the fineness and texture of which no other country could approach, and it held this place until the invention of machinery in England in the last part of the eighteenth century.

Cotton in America

Columbus, when he discovered America in 1492,

found that the inhabitants were using cotton, and Cortez, the Spanish conqueror of Mexico in 1519, found that the Mexicans knew how to weave the finest fabrics of cotton. Cotton was first cultivated in America by some Virginia colonists.

Centers of the Cotton Industry

Manchester, in Lancashire County, England, is the chief cotton spinning and weaving center of the world. Preston, Oldham, Bolton, and other towns in Lancashire and Cheshire are other centers of the industry. Glasgow, in Scotland, and Yorkshire, England, are large producers of colored cotton.

France manufactures the finest cotton goods.

In the New England States, New Bedford, Mass., is the center for fine goods. Fall River, Mass., is the largest cotton manufacturing city in the United States. Rhode Island, as well as Massachusetts, has extensive cotton manufactories.

Charlotte, North Carolina, is the center of the cotton industry of the South. Cotton is also manufactured extensively in South Carolina, Georgia, and Alabama.

The list of cotton manufacturers given in the Appendix shows the large number of factories in these localities.

Factories must be located where there is a moist atmosphere and a good water supply.

Chapter XII

CLASSIFICATION OF STOCK OF COTTON GOODS DEPARTMENTS

A — Domestics (Non-Imported Goods)

1. Materials
   - Calico
   - Cambric
   - Canton Flannel
   - Cheese-Cloth
   - Denim
   - Galatea
   - Gingham
   - Lawn
   - Longcloth
   - Muslin
   - Nainsook
   - Percale
   - Sateen
   - Sheeting
   - Pillow-Case Tubing

2. Weaves
   - Plain
   - Twilled
   - Satin
   - Pile

3. Colors
   - White

Plain Colors
Stripes
Plaids and Checks
Figures (Printed)

B — White Goods (Imported and Domestic Manufacture)

1. Materials
Batiste
Corduroy
Crêpe
Dimity
Flaxon
Gaberdine
India Linen
Lawn
Madras
Marquisette
Mull
Organdy
Persian Lawn
Piqué
Poplin
Swiss
Voile
Novelties

C — Dress Goods (Imported and Domestic Manufacture)

1. Materials
Cheviot
Chiffon
Corduroy
Crêpe
Crêpe de Chine
Dimity

Gingham
Japanese Crêpe
Khaki
Lawn
Marquisette
Mull
Organdy
Piqué
Poplin
Swiss
Voile
Novelties

2. Weaves
Plain
Twill
Jacquard
Fancy

3. Colors
Plain
Woven (Plaids, Checks, Stripes)
Mixed
Figured (Woven, Printed)

D — LININGS (DOMESTIC MANUFACTURE)

1. Materials
Buckram
Cambric
Canvas
Cotton Wadding
Crinoline
Drilling
Heatherbloom
Interlinings
Lawn (Colored)
Moreen

Near-Silk
Novelty Linings (Imitations of Silk)
Percaline
Quilted Linings
Sateen
Silesia

2. Weaves
Plain
Satin
Twilled
Damask

3. Colors
White
Plain
Stripes
Mixed
Figured (Woven, Printed)

E — FLANNELS (COTTON)

1. Kinds
Canton Flannel
Eiderdown
Flannelette
Mixtures
(a) Viyella (Cotton and Wool)
(b) Scotch (Largely Cotton)
Outing Flannel

2. Weaves
Plain
Twill

3. Knitted

4. Colors
Plain
Printed (Stripes, Checks, Figures)

F — Blankets and Comfortables (Domestic and Imported Manufacture)

1. Blankets
   - Wool
   - Cotton
   - Wool and Cotton
   - Imported Novelties
   - Summer (All Wool, All Cotton, Cotton and Wool)
   - Honeycomb
   - Indian
2. Comfortables
   - Silkaline Cover, Cotton Filling
   - Silk Mull Cover, Cotton Filling
   - Jap Silk Cover, Wool Filling
   - Satin Cover, Wool Filling
   - Satin Cover, Down Filling
3. Mattress Protectors
4. Bed Spreads
   - Plain (Hemmed, Fringed, Scalloped)
   - Fancy Weaves
   - Embroidered
   - Printed

Part II—The Linen Departments

Chapter XIII

INTRODUCTORY

Linen Display

What woman is not attracted to the Linen Department, which is so typical of the comforts, pleasures, and intimacies of the home and its duties?

In the modern department store, beautiful tablecloths are displayed on tables, just as they will appear in the home. Doilies of endless variety, delicate creations of crochet and lace, dresser scarfs, sideboard covers, tray cloths, handkerchiefs, and all the innumerable varieties of useful and dainty articles of which linen is made, fascinate customers and salespeople alike.

Towels, with their variegated colors and designs, add a touch of color to the display. Bath towels, large and small, initialed, crocheted, or simply hemmed, are shown, together with wash cloths to match. There are hand towels in damask or hucka-

back, smaller guest towels, and coarse towels for kitchen and pantry use.

At another counter linen materials for different purposes are sold by the yard, many housewives preferring to buy toweling, etc., in this way and do the finishing themselves.

At other counters may be found the sheets and pillow cases which are more often of cotton than of linen, and at other counters the counterpanes and bed spreads, mostly of cotton.

Divisions of the Department

In the large department stores the Linen Department is often divided in the following way:

1. Linen Yard Goods
2. Toilet Linen
3. Bed Linen
4. Table Linen
5. Fancy Linens

Chapter XIV

SOURCES AND PREPARATION OF LINEN FOR MANUFACTURE

Sources

With the exception of some of the crash towelings which are made in this country, the linen goods found in the Linen Department come principally from Ireland, Belgium, Holland, France, Germany, Russia, and the Madeira Islands. Russia raises the greatest amount of flax from which linen is made, but Belgium raises the best quality. In Ireland and Holland where the linen industry has been established for many generations the people have become expert in its manufacture. The war has seriously affected the industry and the price will probably be high for several years thereafter.

Much money has been spent from time to time in an effort to manufacture linen goods in this country, but failure has always resulted, for two reasons. One is that much hand labor is required which in this country is expensive. Another reason is that the climate in the United States is not so well suited to the growth

and development of flax, as a very moist atmosphere is needed.

Characteristics of Linens from Various Sources

Irish linen is white, reliable, and enduring. Old patterns are still used. Some are hand-woven, an honest method, but not always showy. Irish linen includes the table linens, cambrics, lawns, and batistes. Belfast is the center of the Irish linen industry, closely rivaled by Limerick, Dublin, and Dunfermline.

Scotch linen is silver-white, grass bleached, and lighter in weight than the Irish. The designs are more showy, and the prices are moderate. Canvas and tarpaulins are also made in Scotland. Dundee and Aberdeen are the manufacturing centers.

French linen is of exquisite design and especially attractive. The thread is fine and round. Besides table linen the French make expensive dress goods and embroidered linens.

Belgian linen contains the finest fiber in the world. It has more dressing than Irish linen and is made into table linens, twilled fabrics, diapers, and drillings. Ghent is the main flax-growing district.

German linen is silver-white and of high grade. Dresden produces exquisite designs in table linen, and in printed and dyed linen, such as lunch cloths and napkins.

Austrian linen is like the German.

Russian linen cracks, perhaps from the method of bleaching.

English linens are the heavier qualities, used for toweling, aprons, etc. Yorkshire, Leeds, and Barnsley are important centers of production.

Properties of Linen

Regardless of the country from which the flax may come, linen has many distinctive characteristics which differentiate it from all other fibers. The most important are the following:

Absorption. Linen absorbs water quickly.

Evaporation. Water evaporates quickly from linen, making it good for toweling, handkerchiefs, and wash cloths.

Cleanliness. It does not soil quickly. Laundering increases its brilliancy and freshness.

Strength. It is the strongest of the vegetable fibers. Therefore it wears well. Unbleached linen is stronger than bleached of the same weight. It is heavier than cotton.

Smoothness. It is smooth and soft.

Fineness. It may be spun to a most delicate thread, as in fine lace.

Luster. Linen has a luster almost as fine as that of silk. This is seen in tablecloths.

Dyes. Linen is difficult to dye, and the colors often fade.

The Flax Plant

Flax is a bast fiber, that is, a fiber taken from the stalk of the plant. It is found just under the outer bark. A damp and mild climate is best, not only for the growth of the plant, but also for the manufacturing and bleaching of the linen cloth. Flax is also grown for its seed, from which linseed oil is made.

Harvesting

The seeds are sown in the spring. If for fiber production, they are sown close together to avoid branching; if for seed, farther apart. The harvesting time for fiber is the latter part of July and in August before the seeds have ripened. The plant grows to a height of about three feet and when the stalk is yellow for about three-fourths of its length the plant is pulled up by hand with its roots, which not only allows a greater length of stalk but prevents the sap from running out. If the stalks are cut a part of the sap is lost and the fiber is not so good. The plant cannot be used equally well for both seed and fiber because the stalk is too woody after the plant goes to seed; but the woody fiber may be used for twine and rope or woven into coarse material such as dish toweling.

After the plant is pulled the dirt is shaken off the roots and the stalks are tied in bundles.

Flax cannot be raised on the same ground during successive years. Plantings should be four or five years apart in order that the soil may fully recover its nourishment.

Processes for Removing the Fiber

There are five processes for removing the fiber from the stalk, as follows:

Rippling
Retting
Drying
Breaking
Scutching

Rippling or Threshing

Rippling is a process of removing the seeds and leaves from the dried stalk and is done either by hand or by machine. There is great danger of injury to the fiber if this is not done carefully.

If it is done by hand, the flax stalks are drawn through a sort of comb with iron teeth which pulls off the seeds and leaves.

If it is done by machine, the seed heads are removed by being crushed between rollers and the flax straw which is left is then tied into bundles.

Retting (or Rotting)

This process decomposes the gum which holds the woody portion of the plant together. When this gum is dissolved the soft inner fiber of the flax can be easily removed from the woody covering. There are three methods of retting:

Dew retting
Cold water retting
Chemical retting

Dew Retting. This method is used in Russia principally and the flax is usually of a dark color. The flax straw is spread on the grass from 2 to 8 weeks and exposed to the dew, rain, or snow which removes the gummy substance.

Cold Water Retting. There are two methods of cold water retting:

1. Stagnant water. In Ireland bundles of the flax straw are placed in pools of stagnant water and left for about 10 days, during which time the gum decomposes through fermentation. This method also darkens the flax.

2. Running water. In Belgium the water of the river Lys is especially good for retting. The bundles of flax are placed in the water or in crates which are kept under water by weights. The process requires from 6 to 15 days and care must be taken to remove it

from the water at just the right time or the fiber will be weakened. The flax comes out a good cream color.

Chemical Retting. Several processes have been invented for the retting of flax with chemicals, but none of them have yet been very successful as they weaken the fiber and injure its color. The advantage of chemical retting would be the saving of time.

Drying

After retting, the flax is taken out of the water and spread on the grass to dry.

Breaking

This process consists of beating the flax by hand or passing it through machines with grooved or fluted rollers which break up the woody outside substance.

Scutching

The flax stalks are put through a machine with revolving blades of wood which beat and break the outer portion still more. This process also cleans the fibers from the wood or bark. The flax is then tied up and baled ready for market or for the spinning mills.

Chapter XV

PROCESS OF MANUFACTURE

Spinning Processes — Line Spinning

When the bales of flax reach the spinning mills they must be opened and put through the following cleaning and spinning processes:

Roughing
Hackling
Sorting
Spreading
Drawing
Spinning

Roughing

A handful of flax is passed rapidly over a sort of comb with sharp steel points, which remove the remaining straw, dirt, and some loose fiber. It is done by hand.

Hackling

This is a machine process of combing the fiber still finer. Often it is passed through several of these

machines, each one combing it finer than the last. The short fibers which are broken off or combed out are the *tow* which is made into the coarser materials; the long fibers, called *line,* make the finer linens.

Sorting

Fibers of the same length and quality are then put together.

Spreading

The machine for this process is called the spread board. The long fiber is laid in bunches on traveling bands, one bunch overlapping the other. It then passes through sets of rollers which draw out the fibers into one continuous length and produces what is called a ribbon or sliver.

Drawing and Roving

In this process several slivers are put together, drawn out as one, and twisted slightly.

Spinning

This is the final process which converts the loose twisted fibers into fine twisted yarns. There are three ways of spinning:

1. Wet spinning is the process by which the yarn passes through hot water before being twisted. It yields the finest yarns.

2. Damp spinning is the process by which the yarn

comes in contact with a wheel damp with water. By this process the yarn is not quite so fine as in wet spinning. When the old-fashioned spinning wheels were in use a cup of water was often fastened to the frame or placed near at hand so that the flax might be moistened as it was drawn out.

3. Dry spinning is the process by which the fibers are spun without any moisture. Even then it is better to have a moist atmosphere. The coarsest and cheapest yarns are made by this process.

After being spun, the yarn is made into skeins or hanks and shipped all over the world to be made into cloth or thread.

Weaving Process

Some yarns are boiled and some are bleached before weaving. Yarns intended for fine white linens, pillow-cases, sheetings, and damasks are boiled in order to make the cloth firmer and tighter. Yarns intended for glass towels, huckaback towels, etc., are bleached.

Warping and threading preparatory to weaving are the same as for cotton, except that the yarn is given a dressing or sizing to strengthen it for the weaving process.

Weaving linen or making cloth from the spun yarn is more difficult than weaving cotton because the linen

fiber is not so elastic as cotton and is more apt to break.

Principal Weaves

The principal linen weaves are:

Plain weave for sheetings, dresses, embroidery linens, etc.

Twill weave for drilling.

Damask or satin weave (Jacquard loom) for damask table linen.

Weaving Machines

The machinery required for preparing and spinning fine linen is very expensive, a flax spinning mill costing about four times as much as a cotton mill. Although the machinery is not very different from that for cotton the brittleness of the flax fiber necessitates expensive additions to stop the machine automatically when a thread is broken.

Machinery for manufacturing linen did not come into use for a number of years after the invention of cotton machines, until these difficulties could be overcome.

Finishing Processes

All fabrics after leaving the loom are put through certain finishing processes. Probably linen requires

as little finishing as any fiber. The finishing processes which bring out the beauty of the linen are:

Bleaching
Beetling
Calendering or Pressing

These processes repeated several times bring out the gloss. Dressings are sometimes used for the cheaper linens made from tow, but a good linen requires little dressing.

Bleaching

If the yarn was unbleached the cloth may be bleached after weaving. There are two kinds of bleaching: grass and chemical.

Grass Bleaching. By this method the linen, brown or yellow in color, after being put through various processes of washing, boiling in lime and also soap baths, is laid on the grass to whiten. This bleaching takes from six to eight weeks. During this time the linen is often taken up, put through the different processes of washing, and returned to the grass. The place where the linen is bleached must be away from smoke and dust and near good, pure water. Much of the Irish linen is grass bleached, especially the finest qualities. The linen bleached in this way is soft and white and has better wearing qualities. (See Figure 9.)

Courtesy of York Street Flax Spinning Company

Figure 9. Grass Bleaching of Linen

Chemical Bleaching. Most of the linens are now bleached by chemicals, because of the resultant saving in time and labor, although the chemicals are very apt to injure the fiber, rendering the material less durable.

Grades of Bleaching

Four grades of bleaching are found in the stores:

Full bleach
Three-quarter bleach
Half or silver bleach
Quarter bleach

Full bleached linen is not so strong as other linen on account of the chemicals used in the process.

Unbleached linen is the strongest and bleaches in the using.

Beetling

Beetling is a process which gives a soft finish and luster to the material. The dampened cloth is passed slowly through a machine which consists of a pair of wooden rollers to which are fastened heavy wooden hammers. These beat the cloth mechanically, making it soft and smooth, adding luster, and giving to the threads a uniform thickness. Beetling is sometimes done by hand.

Calendering

Calendering is a process which gives the cloth a

smooth surface and an extra glaze. This is done by passing the cloth through a machine with heavy iron rollers. Any amount of pressure may be applied. Sometimes these iron rollers are hollow so that steam may be admitted for hot calendering.

The cloth is then folded, given a heavy pressure in a hydraulic press, marked, and packed ready for shipment.

Chapter XVI

OTHER VEGETABLE FIBERS

Varieties

Some of the cheaper merchandise of the cotton and linen departments is made entirely or in part of vegetable fibers other than cotton and linen. The commonest of these are:

Ramie and China grass
Jute
Hemp

Ramie and China Grass

Ramie and China grass although similar in kind are really two distinct fibers, but being so much alike they are generally considered under the name of ramie.

Ramie or ramie linen as it is often called, has very much the appearance of linen but with a higher luster. It may be used for the same purposes as linen, such as dress goods, underwear, tablecloths, toweling, upholstery, linings, and in the manufacture of hosiery and knit goods. It is also used with silk in the manufacture of union silk goods. It is exceptionally white in color being almost as white as bleached cotton.

The fiber is grown principally in China and India and has been grown in America. The plant from which the fiber is obtained is a hardy shrub growing from four to six feet in height.

Preparation of Ramie

The chief difficulty in its use is the difficulty of separating the fiber from the rest of the plant. In China and India this is done by hand and the fiber is used for the weaving of very fine and beautiful fabrics.

The ramie fiber cannot be removed from the woody substance by simple retting as in flax and jute, but it must undergo severe mechanical treatment to remove the outer bark. The fiber thus obtained is held together by a large quantity of gum and this gum must be removed by a chemical agent before the fibers can be combed out.

Ramie is good for some purposes but it is not so elastic as wool or silk or so flexible as cotton. Consequently, it makes a harsher fabric. As it is difficult to spin to fine counts, the materials made from it are usually of a coarse weave.

Jute

Jute is a vegetable fiber growing principally in India. Although it is used chiefly for making coarse woven fabrics such as bagging and burlap, in the manufacture of twine and small sizes of rope, as a

binding thread in the weaving of carpets and rugs, it is also used with wool to make novelty dress goods.

Like flax it is a fiber obtained from the stalk of the plant which grows to a height of from ten to twelve feet. The fibrous layer is very thick, so that the yield is from two to five times as much as flax.

Preparation of Jute

The preparation of the jute fiber is a more simple operation than the flax although something like it.

The leaves and seed vessels are stripped from the stalks which are then retted in a sluggish stream of water. After the retting or rotting the stalks are pressed and scutched; that is, the outer substance is broken off and the inner jute or bast fiber set free. This fiber then has very little of the woody substance adhering to it.

As jute is more sensitive to the action of chemicals than either cotton or linen, it cannot be bleached very successfully for the action of the bleaching powder weakens the fiber.

The jute fiber is weak compared with other fibers of its kind but the fibers are fine and silk-like and lend themselves readily to spinning. Consequently it is used a great deal where durability is not required, as in the cheap pile fabrics used in upholstery.

Jute is the cheapest of all the fibers used in textile

manufacturing in America, and it is used in great quantities, although it lacks durability especially when bleached.

The color is usually pale yellowish-brown and some of the best qualities are yellowish-white or silver-gray.

Hemp

Hemp is used in the manufacture of homespuns and linen crash, the coarse fibers for sailcloth and canvas, twine, cordage, ropes, and fishing lines. It is also used for the warp in making carpets and rugs.

There are many varieties of hemp, but the so-called common hemp grows as a shrub from six to fifteen feet in height, and is found in many countries. Several varieties are grown in America; a large quantity is grown in Russia and Poland; France and Italy produce a high grade hemp; Japanese hemp is also of good quality and seems to have been the oldest textile fiber used in Japan.

Preparation of Hemp

The hemp fiber is obtained from the plant by a process of retting similar to flax. Dew retting is the method used chiefly, the stalks being spread out on the grass until the action of the elements causes the wood and gum to decompose. The fiber is gray and somewhat harsh. It is a very strong fiber and is not rotted by water. In this respect it differs from jute. It is

seldom used for woven textiles as it is harsh and stiff and not sufficiently pliable and elastic. It also possesses a rather dark brown color and cannot be successfully bleached without serious injury to the quality of the fiber.

Manila hemp is a variety obtained from the Philippine Islands. It is a strong fiber, the coarser ones being used in the manufacture of cordage, while the finer fibers are carefully prepared and used for a high-grade muslin.

Chapter XVII

ADULTERATIONS AND TESTS FOR LINEN

Adulterants

The adulterations used for linen are of two kinds:

1. Cotton
   - Plain
   - Mercerized
2. Sizings
   - Starch
   - Glue
   - Gum

Adulteration with Cotton

Cotton is the cheapest and most common adulteration or substitute for linen. In the processes of weaving and finishing, cotton has been made to imitate all of the other fibers and especially linen; so that many uninformed people do not realize that in buying inexpensive table linen they are buying cotton finished to look like linen.

The adulteration with cotton is often done so skil-

fully that it is difficult to detect until the material has been washed, when the frizzy ends of the short cotton fibers will show on the surface of the cloth.

Large quantities of cotton are imported every year into Belfast, the great linen center, where it is worked in with the more expensive flax fiber.

Difference Between Cotton and Linen

Fabrics made from cotton and linen respectively have their own characteristic qualities of luster, beauty, and qualifications for wear.

While linen is a more beautiful and more expensive material than cotton, yet cloth woven from broken and short ends of poor flax will not be so good or so strong as a good cotton material, while a poor cotton material is the poorest of all.

Adulterations with Sizings

The cheaper grades of cotton and linen are adulterated with sizings in order to give them body or firmness and gloss and to conceal imperfections in the fiber or weave.

The question is often asked: "Why do people hold cotton or linen up to the light, and look through it?"

If poor material is held up to the light one can easily see the coarse weave and thin weak threads and the sizing or starch which is holding the threads

together, while good material will look firm with the threads woven closely together.

Simple Tests

Although there are many chemical and microscopic tests which will show accurately the composition of materials, these can only be made in the laboratory, and it is only the simple tests which are of any use at present to either the buyer, the salesperson, or the consumer. The following tests are not so accurate as the chemical tests, but they aid one in judging until one soon becomes proficient through care and experience.

Burning.

Cotton: Burns quickly and is hard to blow out.

Linen: Burns more slowly and smolders.

Tearing.

Cotton: The edges curl up. Does not tear quickly. Sound not shrill. Ends even and short, tufted, curly, and lusterless. If a cotton thread is broken quickly the end curls up.

Linen: Edge straight and smooth. Tears quickly with shrill sound. Ends uneven, long, pointed, parallel, and glossy. If a linen thread is broken quickly the end remains straight.

Feeling.

Cotton: Is warm and holds the heat.

Linen: Is cool and leathery.

Light Test.

Cotton: Threads are even and uniform.

Linen: Threads are uneven and streaked.

Oil Test.

Cotton: Is opaque.

Linen: Is translucent.

(Note: The dressing must be removed from both materials before the drop of oil is applied.)

Moisture.

Cotton: Does not absorb moisture readily.

Linen: Absorbs moisture quickly.

Washing or Rubbing Test

A mixture of cotton or linen becomes fuzzy when the dressing is removed because the cotton fiber is short and curled at the end.

Acid Test

Wash samples to remove dressing. Immerse in concentrated sulphuric acid for 1½ or 2 minutes. Wash and dry on a blotting paper; the linen fibers remain, the cotton fibers have been dissolved.

Microscope Test

Under the microscope the cotton fiber is flat, short,

twisted, and has no luster excepting mercerized cotton, which is very lustrous, has no twist and appears cylindrical in form.

The linen fiber is long, straight, and lustrous, and the end tapers to a sharp point. It has cross lines at intervals resembling bamboo. Sometimes swellings appear at these cross sections. (See Figure 8 on page 43.)

Chapter XVIII

LINEN YARD GOODS

Art Linen

Art linen is a soft-finished, plain woven linen, made with round hard-twisted yarns. It is usually full bleached or dyed. Its width is from 24 to 36 inches. It is used for embroidery, in making pillow covers, doilies, etc. It is often called round thread linen. It is especially useful when it is necessary to pull threads for hemstitching as the round threads are stronger and do not break so easily as the flat threads ordinarily used.

Bird's-Eye Linen

This is a linen fabric in which the pattern is made up of small figures resembling birds' eyes, these figures being repeated over and over until they cover the entire surface of the fabric.

Butcher's Linen

This is a stiff, heavy, coarse-weave linen. It is used for butchers' aprons, hence its name; and also for dress materials.

Cambric

Cambric was named from town of Cambrai, France, where it was first made in 1520. It is a fine, sheer, plain woven linen. The name French cambric is given to the finest and thinnest variety. It is used for dress goods, lingerie, handkerchiefs, etc.

Crash

This is a coarse linen toweling, either twill or plain-weave, bleached or unbleached.

Russia crash is a very narrow material of coarse thread and coarse weave. It may be used for toweling, also for table runners and art needlework.

Crash suiting is a heavy, plain, rather coarse-weave linen material used for suits for both men and women.

Damask

The name comes from Damascus, where it was first made. It is a beautiful linen material with a figured weave made on a Jacquard loom. These figures are made with a satin weave of the warp threads, and the ground with a satin weave of the weft or filling threads. The linen warp for table damask is dressed before beaming. This dressing not only enables it to stand the friction of weaving, but gives the cloth a beautiful satin finish. Double damask is made with a double thread in the filling and is woven of well-

twisted fiber. In double damask the pattern shows more distinctly than in single damask. That which is hand-woven and grass bleached wears best. For medium quality damask there are 180 thread warps per inch; for fine damask, 220 threads. The filling of double damask has 280 threads per inch; of single damask, 180 threads per inch.

Diaper Linen

This is a strong, soft-finished linen cloth made with a damask weave in a small set pattern. It is used for towels.

Linen Duck

The name is derived from the Dutch " dock," meaning a linen cloth. It is a strong material originally made of linen, now made in both linen and cotton, but chiefly cotton. (See " Cotton Duck," page 65.)

Glass Toweling

This is a linen material of plain weave characterized by plain colored threads of red or blue, woven into the cloth in the form of checks. It is of narrow width and light weight. It is used principally for kitchen towels; the better qualities occasionally being used for embroidery as for sofa cushions.

Handkerchief Linen

This is a fine, plain linen used chiefly for making handkerchiefs, also for dresses and waists.

Holland Linen

This is a plain woven linen finished by a sizing of oil and starch which renders it opaque and impervious to the sun's rays. It is used for window shades. Originally material of this name was used for dress material and was neither calendered nor starched.

Huckaback

The word comes from huckster and back. The huckster in England is a man who carries his wares on his back. It is a linen toweling of various qualities and prices, characterized by the long threads brought to the surface at regular intervals, giving somewhat the appearance of small dots. The better qualities often have a damask figure woven in. The width varies from 16 to 24 inches when sold by the yard, or it comes as separate towels in the regulation sizes and also in small sizes for guest towels. It is also used for embroidering.

Linen Lawn

This is a fine, sheer linen, much like handkerchief linen. It is used for dresses, waists, lingerie, and handkerchiefs.

Pillow-Case Linen

This is a bleached linen material which is used especially for pillow-cases.

Sheeting

This is a wide, heavy linen material which is used especially for sheets. Sometimes, however, on account of its width and quality it is bought for dress and suit material for the reason that, being wide, it cuts to advantage.

Toweling

This is a general term for materials suitable for towels and it is sold by the yard from the piece. The width ranges from 12 to 24 inches. The materials are crash, damask, huckaback, terry cloth, glass cloth, honeycomb, diaper, and momie.

Chapter XIX

TOILET LINEN

Classification

Toilet linen, both linen and cotton, consists of towels of various kinds and sizes, wash cloths, and bath mats. These may be divided into the following groups:

Finished Towels
- Huckaback (Hemmed, Hemstitched, or Scalloped)
- Damask (Hemmed, Hemstitched, or Scalloped)
- Fancy Weaves (Hemmed, Hemstitched, or Scalloped)
- Turkish Towels
- Turkish Bath Sheets
- Crash Towels (Kitchen)
- Glass Towels

Toweling by the Yard
- Damask
- Huckaback

Crash
Unbleached Linen
Half-Bleached Linen
Old Bleach Linen
Glass Toweling
Cotton Toweling
Union Goods
Turkish Toweling
Terry Cloth

Wash Cloths
Woven
Knitted

Bath Mats
Rubber Sheeting

Towels

The name is derived from the Spanish *toalla.*

A towel is a moisture absorbing cloth used to wipe anything dry.

The absorbent property of linen makes it the best material for towels but recent treatments of cotton with certain chemicals makes it answer nearly as well. The rough and fancy weaves are the best for this purpose: huckaback, terry cloth, crash, and softer materials such as honeycomb, momie, and oatmeal. Damask is also used, but it is less effective than the rougher weaves because of its smooth surface.

The finer qualities of linen towels are made in Ireland, Scotland, and Germany. Coarse linen towels and cotton towels are made in the United States. Flax grown in this country for flax seed produces a coarser fiber because the plants are allowed to mature, which makes the fiber tougher. Toweling, both imported and domestic, is made from union goods, a mixture of cotton and linen.

Turkish Towels

The name is said to be derived from the fact that large quantities are shipped to Turkey, where they are much appreciated.

A Turkish towel is a coarse, rough cotton towel with a looped pile surface. (See "Terry Cloth," page 74.) These towels are made in various sizes some of them being especially large.

Although the machinery for making them is of modern invention, the making of this material is of ancient origin. The machinery was invented by Samuel Holt in 1848. In 1855 he was awarded a medal by Queen Victoria, because she was so pleased with the towel which he presented to her, and this immediately established its popularity.

Wash Cloths

A wash cloth should have a rough surface, but should not be harsh or stiff. The loose, open mesh

of the knitted or crocheted wash cloth is preferred by many people because of its softness, and for this reason terry cloth is the most common weave. Wash cloths are usually made of cotton.

Children's wash cloths are sometimes made of silk and linen as silk is softer for a tender skin.

Cloths for washing dishes are made of loosely knitted unbleached cotton.

Damask Towel Design

Designs for finished damask towels are adapted from table linen designs (which see) and usually are less elaborate. The two ends of the towel are the field for the most important part of the design, which may run across the width of the material like a border pattern, or be a "turnover," with the two sides balanced and opposite. The pattern sometimes continues in a narrower border on the sides of the towel. Sometimes these designs are finished only with a line or the selvage.

The body of the towel may be plain but in damask it usually has a diaper or filling pattern of dots or small figures.

Coarse Towel Design

The weave of huckaback, momie, oatmeal, etc., is a design in itself and these towels usually have a plain woven space at each end on which a damask design is

woven. The finer materials in these fancy weaves may have damask patterns on the body of the towel.

An excellent grade of toweling in these weaves has no decoration save the hemstitching at the end. They may be embroidered with handsome initials in white or color.

Design of Fine Grades

The finest grades of towels are almost always pure white. Less expensive ones usually have colored borders, geometrical patterns being common. Fancy towels are sometimes elaborately embroidered either at one or both ends.

Guest towels, which are meant to be used only once, are small and dainty, and are made of the same material as the larger towels. If they are to be embroidered plain material is the best foundation.

Designs for Turkish Towels, Bath Mats, and Wash Cloths

Turkish towels have either white or colored end borders in lines or geometrical patterns.

Bath mats have borders or all-over patterns in plain weave to distinguish them from terry cloth.

Wash cloths have border designs or are ornamented with crochet edges. Those in terry cloth may have all-over designs, but are usually plain.

Plain Towel Design

Toweling by the yard is plain, or it has a diaper pattern in small figures for the face towels and colored cross bars for glass toweling.

Chapter XX

BED LINEN

Definitions

Bed linen is a name which was used when all the sheets, pillow-cases, shams, etc., were made of linen. The term is still used although now these various articles are usually made of cotton.

Bedding is a term used for any and all of the materials and articles used in furnishing a bed, as sheets, pillow-cases, blankets, quilts, comfortables, counterpanes, as well as mattresses and pillows.

Sheets

An extensive business is now done in made and finished sheets. These come in sizes to correspond with the sizes of beds and are finished either with plain hemming or hemstitching. Sometimes they are embroidered. They come from the manufacturer folded in a convenient way for handling and showing.

Three yards, or 108 inches, is considered the best length for sheets.

The width of sheets is given in "quarters," that

is, quarters of a yard, 6 "quarters" being 54 inches wide, and 10 "quarters" 90 inches. Single beds are in such general use now that larger quantities of single sheets are sold. The usual width for single beds is 7 quarters, 63 inches, to tuck in, or 8 quarters, 72 inches, to hang down.

Hemstitched and embroidered sheets are often sold simply to be used as top sheets.

Sheeting

The term sheeting may be applied to any cotton or linen cloth which has a plain weave, soft finish, and suitable weight for bed sheets, but it usually refers to cloth of extra width ranging from 45 to 108 inches.

Rubber sheeting is a cotton cloth coated with rubber to make it water-proof. It is from 27 to 54 inches wide and comes in white or gray. It is used for many purposes where a soft, water-proof material is required. (See manual for "The Notion Department," for a description of the preparation of water-proof cloth.)

Mattress Pads

A mattress pad is a covering used between the sheet and mattress to protect the mattress. It is made of cotton wadding covered with heavy cotton cloth, the whole being quilted together and bound on all four sides.

Pillow-Cases

A pillow-case is the outside covering for a pillow. The regular size is 22 x 34 inches.

Pillow-casing is a plain-weave material which comes from 42 to 50 inches wide.

Pillow-tubing or tubular pillow-casing is a material woven in the form of a tube so that no seam is required in making. In circumference it is from 42 to 54 inches.

Made and finished pillow-cases are in greater demand than the cloth in either form. Pillow-cases are finished with wide plain hems or hemstitching to match the sheets.

Bolster cases for the long pillow or "bolster" which was formerly laid across double beds underneath the pillows are sometimes called for, though now there is comparatively little use for them.

Small cases for pillows placed in front of larger ones or on couches are usually hemstitched and often embroidered. They may be sold in the infants' department or among the fancy linens.

Blankets

Blankets are made of a loosely woven woolen or cotton fabric with a long nap. Originally blankets were made entirely of wool, but these have been replaced in the less expensive grades by union blankets

which are made with a cotton warp and a wool weft or filling. Blankets are also made entirely of thick cotton yarns, the nap being raised by machinery. In a union blanket the cotton warp may be seen at the edge, or when a fold is doubled over the straight lines of the cotton can be detected.

Summer blankets of wool are woven like flannels. They are made in six sizes besides the crib size for infants.

Quilts

A quilt is a bed covering consisting of a soft layer of cotton or wool wadding covered with cloth on both sides, quilted or tacked together at regular intervals, and bound.

The old-fashioned "patchwork quilt" was made of small pieces of cotton or woolen cloth, made into "blocks" of fanciful design. When the blocks were finished and sewed together, a piece of plain cloth was stretched on a wooden frame, sheets of wadding were placed on this cloth, and the patchwork piece laid on top. Then the three layers were tacked together for quilting. The frame consisted of wooden bars on four sides. The quilt was wound upon the two side bars, as the "quilters" who sat in two rows at the sides of the frame stitched it together by hand.

Modern quilts are usually covered with light cotton materials.

Comfortables

These are bed coverings similar to quilts, but with a thicker layer of wadding in them. Sometimes the words are used interchangeably. The coverings for comfortables may be of:

Cheese-cloth	Silkoline
Challis	Sateen
Chintz	Silk
Batiste	

The wadding for the better grades may be of cotton batting or carded wool. Low-priced comfortables may be filled with coarse shoddy or flocks, short refuse wool. Down comfortables or puffs are filled with fine down feathers. These comfortables are exceptionally light and warm.

Comfortables have been factory-made since 1875. Previous to that time they were always made at home. Now factory-made ones are so inexpensive that it is scarcely worth while to make them by hand.

They come in but one size, 72 x 78 inches, except the down puffs, which are made in several sizes.

Counterpanes

The name comes from the French counterpoint, which means point against point, suggestive of the "panes" or small squares of the old-fashioned bed quilt.

A counterpane is the outside cover of the bed. It is made of cotton and woven with a raised pattern, and may be either crochet or marseilles. The crochet counterpane is made of coarse, bleached cotton, woven in conventional patterns by means of a Jacquard attachment to the loom. The term crochet is used because of its resemblance to the old-fashioned "crochet" spreads made by hand. The marseilles counterpane, so called because first made in Marseilles, has a compound weave but the embossed pattern, usually a large design, appears on one side only. The yarn for the face is much finer than that used for the back and has twice the number of threads.

Both of these are woven in continuous strips into from five hundred to one thousand counterpanes in a piece.

After leaving the loom the counterpanes are inspected. Knots and ends are removed and then they are passed over rollers into the bleaching vat, where they remain for about two hours in a solution of chlorine. After being rinsed, boiled, and blued the long strip is dried over smooth, heated rollers. The counterpanes are then cut apart with sharp knives, hemmed, folded, ticketed, and shipped.

Bed Spreads

Counterpanes are often called bed spreads, though

the latter are usually of lighter weight, being made of dimity, cretonne, or of corded material with or without fringe. They may be stamped in colors.

Children's Spreads

Dainty covers for children's cribs and carriages made of fine marseilles, dimity, or embroidered muslin, and edged with lace or embroidery, as well as embroidered baby pillows and cushions, add much to the attractive display in this department.

Sizes of Bed Linen

These sizes are the same for cotton and linen.

Sheets

54 x 96
63 x 96
72 x 96
72 x 108
81 x 96
81 x 108
90 x 96
90 x 108

Pillow-Slips

22½ x 36 (regulation size)
25 x 36
27 x 36

Bedspreads

72 x 90 (single bed)
72 x 100 (single bed)
80 x 100 (3 quarter bed, or double, not hanging down)
90 x 100 (double brass bed)
97 x 116 (extra size)

Blankets

60 x 80 (single bed)
60 x 90 (single bed)
72 x 82 (3 quarter)
72 x 90 (3 quarter)
76 x 84 (double)
80 x 90 (double)

Comfortables

72 x 78 (one size)

Chapter XXI

TABLE LINEN

Classification

Table linen consists of:

Table Cloths
Napkins
Tea Cloths
Tray Cloths
Doilies
Silence Cloths

Table Cloths

Linen table cloths have long been used to cover the table on which a meal is to be served. Because of the high price of linen, many cloths are now made of union goods or cotton. The finer cloths are white with a damask weave, but some linens and many cheap cotton cloths are made in colors.

Table cloths may come in more than thirty sizes. A table set consists of one table cloth and twelve napkins which match in design, quality, and color.

Napkins

A napkin is a square piece of cloth used at the table to wipe the hands and mouth and also to protect the clothes.

The name was originally used to mean a handkerchief and some of the Scotch people, still call handkerchiefs pocket napkins.

Until recently, napkins were made of linen and woven with a damask pattern. Cotton napkins are now used to some extent and especially since through the process of mercerizing a good imitation linen can be obtained. These mercerized cotton napkins make a good ordinary napkin, but should never be sold as linen. Still cheaper cotton napkins are made with a calendered finish, a gloss resembling the luster of mercerized cotton or linen, but which will wash out leaving a cheap plain cotton material.

Napkins are woven in long strips, attached to each other end to end. The strip is usually the width of the napkin with a selvage on each side. They are sold at the counters in packages of a dozen or a half dozen, and must be cut apart and hemmed on the ends by the purchaser. Cheap napkins are sometimes woven several napkins in width as well as in length, in which case they must be cut apart and hemmed all around. Cheap napkins may also be bought singly already hemmed by machine.

The sizes of napkins range from 16 inches to 32 inches square, and are known as breakfast napkins, dinner napkins, and tea napkins.

Tea Cloths

A tea cloth is a small cloth of plain, bleached linen or damask having either a hemstitched or scalloped edge and sometimes finished with drawn-work or embroidery. It is used as a cover for a table or a tray.

Tray Cloths

A tray cloth is an oblong piece of cloth, made of different materials, such as plain, bleached linen, damask, etc., and finished with hemstitched edge, fringe, or scallops. It is used to cover a tray on which food is carried, also on the table to protect the table cover.

Doilies

A doily is a small mat or centerpiece, made of embroidered linen, cotton, or lace. Originally it was a small fringed napkin woven in colors. They are named from Sir John D'Oyley, an English merchant, who first made them.

Doilies come in sets and are used to decorate dining-room tables, sideboards, dressers, etc. A luncheon or tea table is often set with doilies of different sizes for the plates, glasses, and often the dishes, in which case a table cloth is dispensed with. Doilies used in

this way are suitable for less formal occasions. They are also placed on plates under finger bowls, ramekins, or glass dishes for fruit, etc. Glass is more effective when placed on linen than on china.

Silence Cloths

Silence cloth is the name given to any heavy cloth which is laid under the table cloth to deaden the sound of the dishes and also to protect the table varnish from heat. It is usually made of cream colored or white woolen felt or a double-faced cotton flannel, and ranges in width from 54 to 64 inches.

Asbestos Pads

Asbestos table pads made of sheets of asbestos board covered with cotton flannel are taking the place of silence cloths, as asbestos is a poor conductor of heat, and therefore a better protection for the table.

Any soft cloth laid under the table cloth adds to its apparent weight and richness.

Where doilies are used on an uncovered table, small asbestos mats are placed under the doilies upon which hot plates are to be set. These mats come in a number of different sizes, both round, and oblong.

Sizes of Table Linen

The standard sizes for table cloths, both hemmed and unhemmed, napkins, and doilies is given in the following table:

Unhemmed Tablecloths

1 yd. square
1¼ " "
1½ " "
1¾ " "
2 " "
2 x 2½ "
2 x 3 "
2 x 3½ "
2 x 4 "
2¼ x 2¼ "
2¼ x 2½ "
2¼ x 3 "
2¼ x 3½ "
2¼ x 4 "
2½ x 2½ "
2½ x 3 "
2½ x 3½ "
2½ x 4 "
2½ x 4½ "
2½ x 5 "
2½ x 5½ "
2½ x 6 "
2½ x 7 "
2½ x 8 "
3 x 3 "
3 x 4 "
3 x 5 "
3 x 6 "
3½ x 3½ "
3½ x 4½ "
3½ x 5½ "
3½ x 6½ "
4 yd. sq. } for cutting
5 " " } round.

Hemmed or Scalloped Tablecloths

36 x 36 in. (tea cloth)
54 x 54 "
72 x 72 "
80 x 80 " (rise by ¼ yd.)
90 x 90 " " " " " "
Add a leaf by adding ½ yd.

Unhemmed Napkins

Tea: 16 in.
17 "
18 "

Breakfast: 19 in.
20 "
21 "
22 "

Dinner: 24 in.
25 "
26 "
27 "
28 "
29 "
30 "
31 "
32 "

Doilies

12 in.
14 "
16 "
18 "
20 "
24 "

Table cloths and napkins are folded, irrespective of size, into 7-inch folds. The finer qualities are wrapped singly in either blue or gray paper. On this paper and also on a paper pasted on the cloth are written the registered number, size, and name of design.

Classification of Designs in Table Linen

The problem of the designer is to fill a certain space with a pattern having the proper balance of lines and spaces. Textile design makes certain demands and has its special limitations, and table linen must be considered a special field for even the textile designer. At first thought it seems as if the problem were easier than that of the man who has to keep his pattern within the narrow width allowed for dress goods, but this is not the case.

The standard designs for table linen are:

Shamrock	Poppy
Snowdrop	Fleur de lis
Maidenhair fern	Checks
Rose	Stripes
Thistle	Polka dots
Acorn	Scroll patterns

Difficulties of Designing

A salesperson may wonder why there are so few patterns instead of the almost endless number shown

in carpets, wall paper, or yard goods. The reasons may be found in the lack of color of the weave, and the necessity for making the design in different proportions for different lengths of cloths.

First, the pattern is usually without color which makes it depend for its beauty entirely upon the reflection of light by the "floats," or threads which lie on the surface of the cloth. Table linen is always woven with a damask weave in order that the pattern may be thrown out by the alternate reflection of light on the masses of warp and weft threads.

The pattern must also be simple and flat. Shading is not apt to be successful because it blurs the effect and patterns with a great many lines break up the shining satiny surface. Very delicate patterns should be made only in finely woven linen, as coarse threads make a ragged outline for a dainty design. The flower patterns which come in the finest linens have certain characteristic lines which have been found to be most successful.

The necessity for making a pattern which can be lengthened out for tables of different lengths limits the designer more than anything else.

Method of Designing

If the maker of table linen could plan just for a square or oblong design his work would be easy. He would first design a square or oblong with all its

corners alike and then fill in the center with a radiating, circular, or repeating pattern. He could carry the central design into the border or bring the border into the central field.

He cannot make so simple a plan, however, because his design must be suitable for spaces beginning with a square and ending with an oblong whose length is two or three times its width. He must be able therefore to draw out his pattern and insert sections in it just as the leaves are inserted in an extension table.

Sometimes the lengthening is so cleverly done that it is impossible to discover the lengthening pieces, the pattern being perfect in each size. A small conventional design is easy to extend but one with branching scrolls or natural growth must be treated very skilfully or it will fail to connect properly.

Such patterns are usually divided in the center and the extra pieces are inserted there. If the central pattern has been circular, it becomes oblong, or the figures are turned around so as to make two circles. The border pattern must be so designed that additional branches will seem to come in naturally.

Sometimes the lengthening pieces are not added in the middle but half way between the middle and the ends. This leaves the central pattern undisturbed but requires careful adjustment in the border. If a flowing pattern is used the figures must be just the size

Courtesy of James McCutcheon and Company

Acorn and Oak Leaf (upper) Thistle (lower)

Figure 10. Designs in Table Cloths

of the lengthening piece, either 9 or 18 inches, so as to be used as a repeat, or else sprays, twigs, or other small figures must be brought in "naturally," that is without the break being noticeable. This requires considerable skill.

In Figure 10 the acorn and oak leaf pattern can be lengthened by lengthening the longer festoon or inserting another small festoon, as the figures cross on one side only. The thistle pattern can be lengthened by the addition of sprays or small figures.

Designs of Borders

Borders may be designed in three ways:

The pattern may run around the cloth in a continuous line.

It may begin at the corners and meet in the middle of each side.

It may begin at the middle of the sides and meet at the corners.

The last two will make a well-balanced corner design, but the continuous pattern must be modified at the corners or a block or a panel design must be put in at the corners to cover the turn.

Designs for Other Table Linens

Napkins in sets to match table cloths have the same designs in a smaller size.

Doilies are made in symmetrical or semi-symmetrical patterns.

Circular table cloths, napkins, and doilies have either a design radiating from the center or a circular border around a plain or diapered center. The central design may extend to the edge or it may occupy only that part of the table cloth supposed to lie on the table, while the hanging part has a circular border pattern.

Chapter XXII

FANCY LINENS

Classification

Fancy linens are found in the Linen Department, but they have their separate counters. They include lace-trimmed and embroidered linens for:

Dresser Scarfs
Sideboard Covers
Table Covers
Squares
Cases for Handkerchiefs, etc.
Tea Napkins
Tray Cloths
Doilies
Luncheon Sets
Japanese Bungalow Sets

These are all made in foreign countries. The best are made in Great Britain. The cheapest goods came originally from Belgium, Germany, Switzerland, France, and Japan.

Although these embroidered linens are sent from

different countries they are almost entirely worked upon Irish-made linens. Since labor is cheap in Japan that country exports quantities of goods of this kind that may be sold at reasonable prices.

Laces

The laces used in fancy linens are:

Cluny, a heavy bobbin lace.
Filet, a square mesh lace.
Renaissance, a lace made of braid formed in patterns.
Torchon, a bobbin lace made in simple patterns.

All of these laces were originally made by hand of linen thread, but all of them are now imitated in a cotton lace made by machine. Though Cluny and Torchon lace are both made with bobbins the Cluny has more elaborate patterns, which are darned on an open ground. Some Cluny sets are hand-made. Renaissance or Battenberg lace is not used so much as it was a few years ago. Filet, which is very popular at present, is an imitation of the expensive hand-made filet.

Embroidery

The embroidery on fancy linens is usually done by machine, that done on the Swiss embroidery machines being almost equal to hand work.

Madeira embroidery, which is seen on tea napkins, tray cloths, doilies, and small table cloths is done by hand. Sometimes, however, in cheaper grades the edge is done by machine. The patterns are usually in one corner of the cloth and the edge is scalloped.

Drawn-Work

Mexican drawn-work is also seen in all fancy linens. Sometimes the center of small doilies consists entirely of drawn-work, sometimes it occupies the corners or runs around the cloth as an insertion.

The drawn-work is made by drawing out a part of the threads of a piece of cloth, and using the remaining threads as a base for elaborate designs made with a needle.

Japanese Sets

Japanese bungalow sets are made of soft cotton materials printed in attractive designs.

Imitations

These articles may also be found at lower prices, made of union materials, that is, linen and cotton. However, they should be so marked that inexperienced salespeople will know that they are not pure linen.

A store in which this is done soon gains a reputation as a " reliable store " and gains rather than loses purchasers, especially if the salespeople can show definitely the reasons for variations in price.

Chapter XXIII

THE HANDKERCHIEF DEPARTMENT

Location

Handkerchiefs are usually found in a separate department, seldom with other linen goods. Men's handkerchiefs, for instance, are often sold in the men's furnishing department.

Handkerchief

The name comes from the words "hand" and "kerchief." Kerchief originally meant a cloth to cover the head. A handkerchief is a small square piece of linen, cotton, or silk cloth, carried for the purpose of wiping the face or hands.

Materials

Linen is the best material for handkerchiefs because it is soft, absorbs moisture quickly, and launders well. Cotton is very apt to be harsh and to lose its finish in laundering; also it does not absorb moisture readily. Nevertheless large quantities of cotton and union handkerchiefs are made and sold, many of them erroneously marked "pure linen." Fine lawn is used

frequently. Some "Irish linen" handkerchiefs are only 50 to 60 per cent linen, the rest being cotton.

Silk does not absorb moisture readily and although silk handkerchiefs have been popular at times they are more suitable as kerchiefs for the head or neck than for the hand.

Lace handkerchiefs also have been very fashionable at times. They consist of small squares of linen bordered with lace. Real lace handkerchiefs of exquisite quality and workmanship are among the most costly articles in a woman's wardrobe.

The mourning handkerchief is edged with a black border of various widths. They are not often used except by people in deep mourning.

Grades and Sizes

The cheapest handkerchiefs are machine hemmed; the next grade may be machine hemstitched. There are handkerchiefs with hand hemstitching, embroidery, or lace-trimmed edges, and initials; the embroidered and initialed ones naturally being higher priced. Many stores take orders for special monograms or initials to be embroidered on handkerchiefs.

Handkerchief sizes range from 12 to 18 inches square for women, and from 20 to 22 inches for men. The hems vary in width from one-fourth of an inch to one inch.

Handkerchiefs of the cheaper grades are put up in boxes containing five dozen. The better grades have a dozen or a half dozen in each box.

Designs for Handkerchiefs

There are four types of patterns for handkerchiefs:

Patterns which follow the border.
Patterns repeated in each of the four corners.
Patterns for one corner only.
Initials or monograms more or less elaborate.

Patterns which follow the border should be small and symmetrical. If flower forms are used they should be conventionalized and the best balanced designs are the most satisfactory. Geometrical designs, as the fret or key pattern, squares, or scrolls may be used effectively. Corded or colored stripes are used in less expensive grades.

If the pattern is repeated in each of the corners it may have a little more freedom than a border pattern but it should be a "turnover," that is, one which has its two sides exactly corresponding but turned in the opposite direction.

A pattern for one corner only may be very elaborate. It is usually more effective when the handkerchief is folded than when it is spread out as the "corner" often looks out of proportion to the rest of the square.

Unsymmetrical figures such as sprays of flowers strewn across the corner, or several figures turned the same way, are very inartistic designs.

Initials or monograms either plain or in a more or less ornamental frame are the best decoration for the single corner. There is an obvious reason for not repeating initials and usually they are not so large as to look out of proportion. Some very long narrow initials, however, are out of proportion.

History

Handkerchiefs were originally made of silk and are first mentioned in the chronicles of the sixteenth century. Originally these pieces of silk cloth were used only by priests at the altar, but gradually they came into general use. The Empress Josephine is said to have made them popular and now they have become an indispensable article.

Centers of Industry

Linen handkerchiefs are made in Ireland, Scotland, Belgium, Germany, France, and Switzerland. Most of the pure linen handkerchiefs come from Belfast, Ireland. The finest grades of embroidered handkerchiefs come from Ireland, although the greatest quantities are made in Switzerland, the principal center being St. Gall.

Many of the Swiss handkerchiefs are of cotton,

embroidered by machine; while the Irish handkerchiefs are embroidered by hand, though in the less expensive grades these also are made partly of cotton. Fine lawn handkerchiefs come from France and Switzerland. Silk handkerchiefs are imported from China and Japan.

Chapter XXIV

HISTORY OF LINEN

Ancient Manufacture

The cultivation of the flax plant and the spinning and weaving of linen began in very early times. Linen is mentioned in the Bible as a part of the priests' clothing at the time of the exodus from Egypt, which took place more than three thousand years ago. Very fine linen is found in Egyptian mummy cases.

The Greeks and Romans imported their linen from Egypt at first, but later made it themselves.

Medieval Manufacture

In the tenth century linen markets were established in Bruges, Courtrai, and other places. During the eleventh and twelfth centuries many Flemish weavers went to England and built up the linen industry there.

From that time until the eighteenth century flax was the most important vegetable fiber, and the manufacture of linen was general in western Europe; but during all of this period the cultivation of the flax and the spinning and weaving of the cloth was solely a home industry.

Introduction of Machinery

Then the introduction of machinery stimulated the manufacture of cotton which, on account of its short fiber, had been hard to spin by hand; and in the latter part of the eighteenth century cotton cloth began to displace linen because it was so much cheaper. The demand for good linen, however, has almost always been greater than the supply. The European countries which have developed linen manufacture are Ireland, Scotland, England, Belgium, France, Germany, Austria, and Russia. (See Appendix.)

Cultivation in the United States

Flax was introduced into this country by the early colonists, the records showing that it was grown in Massachusetts as early as 1630. Its manufacture into linen was, however, only a household industry for family use and very little was sold. Flax was also grown in Vermont, Connecticut, New York, and New Jersey, but with the increased use of cotton the industry declined.

At present flax is grown in the United States for its seed; only a few coarse varieties of cloth being manufactured from it.

Manufacture in the United States

The linen products manufactured in this country are

chiefly thread and twine, and coarse linen toweling; but the industry is a growing one.

Effect of European War

The European war has so limited the manufacture and export of linen that prices have more than doubled and very little pure linen can be had at any price. Nearly all of that now sold is union goods, that is, a mixture of linen and cotton.

A Belfast report stated that during the first six months of 1915, 2,664 tons of cotton were imported to be used in the manufacture of union fabrics. During the same period in 1916, 5,021 tons of cotton were imported for this purpose.

Part III—Suggestions to Salespeople

Chapter XXV

SELLING SUGGESTIONS

Arrangement and Display

In the departments where colored cotton or linen fabrics are sold, there is a large opportunity to arrange effective and artistic displays by good color combinations.

Many of the colored fabrics are shown on the counters, the bolt either lying flat or standing on end, with part of the material unrolled and hanging down. A pleasing and effective color combination will draw customers to the counter while a confusion of colors with bad color harmony will cause people to turn away, not even stopping to look for the material which they may really want.

In showing materials a fabric should be taken away if it spoils the effect of other colors which are being shown. Otherwise a sale may be lost. On the shelves also a more pleasing effect is gained if the

arrangement of color combinations is considered.

Suggestions for trimming one fabric with another, and ways of making up the materials may be suggested in displaying fabrics.

In order to keep goods looking fresh and clean they should be put away quickly after they have been shown. This also keeps the counter looking well.

Materials

When one is beginning to sell materials the names of the fabrics and the sections in which they are kept should be learned as soon as possible. The widths and prices must be learned, and most important of all the quality of the materials, whether the quality is worth the price and why it is worth the price.

In selling yard goods care must be taken to give the correct measurement. Every customer wants the full amount for which she pays, but if several inches too much is given to each customer, the profit for the department is considerably lessened and perhaps lost entirely.

A salesperson must learn to cut materials straight as much loss may come to the department through the straightening which may be necessary later.

With materials that may be torn, not only the first selvage must be cut but the selvage at the opposite side also. Otherwise the material may tear along side of

the selvage and not across it. Unless the material is torn quickly there is danger that it may tear down on some heavier lengthwise thread instead of straight across.

Suggestions as to Care

Salespersons are often asked if goods will shrink or fade and they should know something of the shrinkage of their goods and the effect of water and heat on different materials. For instance, a cheap cotton material usually becomes thin and sleazy after washing because the starch washes out and leaves a poor loosely woven material. Again, hot water, a hot iron, and strong sunshine will fade colors. Hot water may cause colors to "run," as with materials which are made up of a colored stripe and a white stripe where the color runs into the white.

Suitability

The salesperson is often asked to suggest materials suitable for certain occasions or purposes. In order to advise a customer intelligently she should study the patterns and color combinations of her stock, observe the choices made by her customers, and listen to their comments. Then she must use her own judgment with regard to their value, training her own eyes and her own taste by looking at the best models.

Handsome linens are often purchased for gifts, par-

ticularly for wedding gifts, and the customer wishes to know what patterns are most approved as well as what styles are suitable for the purpose. When another person's taste is to be considered the salesperson is often called upon to give an opinion. If she can give good reasons for her suggestions the customer will rely upon her judgment.

Manufacture

The salesperson who understands something of the source and growth of the raw material of which fabrics are made, as well as the manufacture of this raw material into cloth, will understand better the differences in the qualities of fabrics, and will be able to explain when necessary the difference in the cost of materials, that is, why some can be bought for a small price and why others are expensive.

The question of frankness about quality is often raised, especially with regard to the adulteration of linen with cotton. Very often customers will ask whether certain low-priced articles are all linen. A knowledge of qualities is most necessary when dealing with a critical customer.

Upon advising the salesgirls to tell the truth in answering questions, one replied: "If, when they ask us, we tell them the squares are cotton and not linen they walk away from the counter and we lose a sale."

Suppose this same sale were made, and the customer thought she was buying linen when really it was cotton finished like linen, what would be the probable result?

Result of Misstatements

The customer upon examining her purchase more closely would become suspicious. If she concluded it was not linen, the article would be returned; in which case not only would the sale be lost, but the firm would be put to more trouble and expense than if the sale had been lost in the beginning.

Again, if the customer did not at first discover that the material was cotton she would detect the fraud after it was laundered, with the result that she would lose her faith, not only in the salesgirl, but also in the firm, and would buy her linen at some other store even if she paid more for it, which probably she would have been willing to do in the first place.

A knowledge of the manufacture and wearing qualities of mercerized cotton will help in the selling of that material not only in the dress goods department but also in the table linen department where much of it is sold for ordinary household use.

History

All people know that cotton is widely used but not all people realize that this has been made possible through the invention of machinery.

Housewives admire fine and handsome linen. They also know that it is expensive, but do they know that the hand labor required in the preparation of the flax fiber is one reason why it is expensive and that no machinery has been invented which will do this work successfully?

Our grandmothers used linen instead of cotton because linen could be more easily and successfully made by hand than cotton. Linen was the first material made, and it has been used for centuries, but now it is being replaced more and more by cotton.

Chapter XXVI

LAUNDERING OF COTTON AND LINEN FABRICS

Knowledge of Laundering

Nearly all the goods sold in the cotton and linen departments are bought with the expectation that they may be laundered without injury. It is therefore very necessary for a salesperson to know what are the best methods of laundering and what materials require special treatment, in order that she may be able to advise the customer and prevent the dissatisfaction which arises from ignorance or carelessness.

All materials, before being brought to the stores, have been pressed in some way. Most of them have been passed between rollers. Some of them have been washed. White linens have been washed and bleached.

Primitive Methods of Laundering

In early days women washed their linen by holding it or shaking it in running water or by pounding and rubbing it on a flat stone. The second method, still

practiced in some European countries, is very hard on linen or cotton cloth.

Usual Method

The methods of laundering used by our grandmothers and familiar to most of us are:

Soaking the clothes for some time in a tub of cold water.

Soaping the soiled spots and rubbing them on a wash board.

Boiling, rinsing, bluing, and starching.

Wringing, drying, and ironing.

Labor-Saving Devices

Washing machines replace tubs and boards and as they cleanse by forcing streams of water through the material instead of rubbing it against a hard board they are less severe on the fabric.

Gas and electric irons which retain their heat are often substituted for the iron that requires reheating. Mangles are much used for pressing or "mangling" table and toilet linen, bedding, and all flat work. Mangles are machines with large rollers, one of which is usually heated and the other cloth covered like an ironing board. Cloth may be pressed between these rollers.

Effect of Washing on Fibers

Cotton and linen are vegetable fibers and are of a

woody nature. They are strong and tough and may be washed, boiled, starched, and ironed without injury. All cotton goods will shrink, but linen does not shrink unless mixed with cotton. Coarse-weave linen will stretch. Some dyes do not unite readily with cotton and linen and therefore the colors fade, and some fabrics lose their finish when laundered. Linen launders more easily than cotton, but must be handled more carefully, as the fibers are brittle and liable to break, especially if starched stiff. Care should be taken in the laundering of all delicate fabrics, especially in regard to the materials used in soap, starch, and bluing. Clothes often become yellow from careless washing.

Bleaches

The best bleaches for cotton and linen are sunshine, moisture, and fresh air. Chloride of lime is used in the mills. The chemical weakens the fibers somewhat, which accounts for the fact that unbleached materials are stronger than bleached.

Cleansing Materials

Laundry soaps are made of a combination of fat with an alkali (usually caustic soda). They also contain soda, borax, ammonia, kerosene, benzene, and naphtha. Soda, borax, and ammonia add to the

cleansing properties, but should not be too strong. Kerosene loosens the dirt and also softens the water, while benzene and naphtha cut the grease.

Yellow and White Soaps

Some laundry soaps are white and some are yellow. White soaps have been found by chemical analysis to be purer than yellow or darker soaps. Yellow soaps contain resin, which is a gum from trees. This resin aids in forming suds, but as the suds are sticky and gum-like, they often cause a scum to form, which will adhere to the clothes. The sticky feeling of the yellow soaps is caused by the resin.

Quality of Soap

The quality of any soap depends upon the cleanness of the fat, the proportion of fat and alkali, and the kind and amount of other substances.

Soaps which contain strong soda, borax, etc., should never be used for fine materials, though they serve a useful purpose in cleaning heavy fabrics which have been much soiled.

Other Forms of Soap

There are many soap powders on the market, which are powdered soap with more or less washing soda.

Soap flakes come in pure form and may be used instead of cake soap in the laundering of delicate fabrics.

Soap solution is made by dissolving shavings of cake soap or soap chips in hot water. This on cooling forms a jelly, which may be kept and used in washing all colored materials.

Washing soda is used in many home laundries, but as it contains an excess of alkali, it is a dangerous substitute for pure soap.

Substitutes for Soap

If the color seems very uncertain, substitutes such as soap bark, bran water, or starch water may be used, as it is the alkali in the soap which often affects the color. None of these substitutes, however, are useful if water alone affects the color.

If bran or soap bark is used, four cups are required to one gallon of water.

For starch water, 3 tablespoons of starch to 1 gallon of water should be used.

Each of these may be cooked 20 minutes, then strained, and the water which is left used in the place of a soap solution in the wash water. Wash and rinse as usual. If starch is used there would be enough starch left after the rinsing water to give a slight stiffness if the material is ironed wet.

Starch

Starch is a substance contained in the cells of grain and of some other plants. Heat and moisture cause

these small granules to burst and form a jelly-like substance.

The sizings which manufacturers put into the cloth are often made of starch. This adds weight to the cloth and fills in the spaces between the threads, especially if the material is cheap and loosely woven. The starch also stiffens the material and prevents its soiling and mussing when handled.

Laundry starch comes principally from corn, rice, wheat, and potatoes.

Corn starch is the cheapest sort and is consequently used the most. The results are very satisfactory.

Rice starch is the most expensive, but it is particularly good for fine meshes, lingerie, and sheer dainty fabrics as it gives a new finish to the material.

Wheat starch is used in public laundries, as it gives stiffness and pliability to the material.

Potato starch is in use in the factories as a filling for cloth.

Substitutes for starch are borax, gum arabic, glue, and dextrin, which are especially good for colored goods and are used where the white starch might show.

Recipe for Starch

To one quart of water add from 1 to 3 tablespoonfuls of starch according to the thickness of the article

to be starched. Add also one-half teaspoonful of fat and one-half teaspoonful of borax.

Starch should boil gently for at least fifteen minutes. Otherwise it will not be sufficiently cooked and will leave white spots on the garment and the iron. The heat of the iron continues the cooking process. Starch must not be too thick.

Bluing

Bluing is used to whiten clothes. Careless washing with dark colored soaps often causes cloth to become yellow. Bluing counteracts this tendency.

Kinds of Bluing

The kinds of bluing are: indigo, of vegetable origin from the indigo plant; ultramarine, of mineral origin; Prussian blue, a chemical compound; and aniline blue, a chemical product made from coal tar. Indigo is also now manufactured chemically. Bluing is sold either in solid or liquid form.

Indigo was the first bluing used, but the color is dark and dull. This fact, together with the cost of manufacturing, makes it less desirable now that other blues may be obtained. It comes in solid form.

Ultramarine blue came originally from the stone lapis lazuli, which was ground fine. It is now manufactured chemically. It has a bright color and is

much used in the home. This is the bluing which is sold in little balls.

Prussian blue is of chemical origin with a compound of iron as one of its bases. It is of greenish color and sold in liquid form. It is used in many households, but if the clothes are not thoroughly rinsed or if any of the blue is left in the clothes, the iron in its composition will unite with the alkali of the soap and iron rust spots will appear on the clothes in a most unaccountable manner.

Aniline blue is a strong dye and only a small quantity is required. It is sold in solid or liquid form. As compared with other blues it is cheaper and more effective and gives a good clear color. It is used principally by public laundries.

Proper Methods of Laundering

1. *To Prevent Shrinking.* Cotton goods should be shrunk before making. Goods shrink less when washed and dried quickly and ironed before they are entirely dry. Cotton goods will average one or two inches shrinkage to the yard. Linen goods shrink very little, but coarsely woven linen will stretch.

2. *To Prevent Fading:*

(a) Use pure or white soap for all colored cotton and linen goods. Strong soap should not be used and no soap should

ever be rubbed on the fabric, but soap jelly should be made and dissolved in the water.

(b) Warm water, not hot, should be used.

(c) Soaking in strong salt and water before washing will help to set the dye.

(d) Materials of different colors should never be washed in the same water, as the colors from one material may be transferred to the other.

(e) Articles should be hung in the shade to dry as strong sunshine will fade them. Fading is more often due to careless drying than to any fault in washing.

(f) Colored goods should not be folded when wet or ironed with a very hot iron.

(g) Colored articles should not be laid next to white ones for the color may be transferred to the white ones.

(h) Strong bluing will strengthen a blue.

3. *To Set Colors.* This process must precede the washing. Salt, vinegar, or sugar of lead, a poison, may be used, according to the color of the article.

For general purposes salt is used for setting or brightening colors. Use one tablespoonful to one quart of cold water. Soak the garment in this solution for an hour or more, then rinse thoroughly in

two or more waters to remove the salt, which if allowed to remain will prevent the soap from making a good suds.

Vinegar is sometimes preferred for purple and black, as it not only fixes the color but may restore the tint to a faded purple or violet. Use one-fourth cup of vinegar to one gallon of water, allowing the garment to soak for an hour or two before washing.

Sugar of lead may be used for delicate greens, blues, and tans, one teaspoonful to one gallon of lukewarm water. Stir until dissolved. Soak for one hour, wash, etc.

4. *For Gloss and Finish.* Linen table cloths and napkins should be ironed when quite damp, and the ironing should be continued on both sides of the cloth until it is "bone dry." This gives linen its beautiful gloss. Mercerized cotton keeps its gloss after laundering, but calendered cloth, an imitation of mercerized, loses its finish.

Mangling is a quick and easy method of pressing, but it hardens linen, leaves a poor gloss and gradually wears off the fiber, leaving it thin and sleazy.

Special Directions

Embroidered waists and similar things should be ironed on the wrong side over several thicknesses of flannel or a turkish towel so that the embroidery may

sink into the soft material and not be ironed flat.

Corduroy may be washed in warm, soapy water by sousing it up and down. It is then rinsed in the same way and hung dripping on the line to dry. Garments should be put on a hanger or hung by the belt, as the line will mark them. When nearly dry the nap should be brushed and smoothed down.

Chapter XXVII

CLASSIFICATION OF STOCK OF LINEN DEPARTMENT

A — Linen Yard Goods

1. Materials
   - Art Linen
   - Bird's-eye Linen
   - Butcher's Linen
   - Cambric
   - Crash
   - Damask
   - Diaper Linen
   - Linen Duck
   - Glass Toweling
   - Handkerchief Linen
   - Holland Duck
   - Huckaback
   - Linen Lawn
   - Pillow-Case Linen
   - Sheeting
   - Toweling

2. Weaves
   - Plain
   - Twill
   - Damask

Bird's-eye
Huck

3. Colors
White
Plain Colors
White and Colors

B — Toilet Linen

1. Finished Towels
Huckaback (Hemmed, Hemstitched, or Scalloped)
Damask (Hemmed, Hemstitched, or Scalloped)
Fancy Weaves (Hemmed, Hemstitched, or Scalloped)
Turkish Towels
Turkish Bath Sheets
Crash Kitchen Towels
Glass Towels

2. Toweling by the Yard
Damask
Huckaback
Crash
Unbleached Linen
Half-Bleached Linen
Old Bleach Linen
Glass Toweling
Cotton Toweling
Union Goods
Turkish Toweling
Terry Cloth

3. Wash Cloths
Woven
Knitted

4. Bath Mats
5. Rubber Sheeting

C — Bed Linen

1. Sheets and Pillow-Cases
   - Plain Hemmed
   - Hemstitched
   - Scalloped
   - Embroidered
2. Blankets, Comfortables, and Bed Spreads
   (See "Classification of Stock of Cotton Goods Departments," pages 84–88)

D — Table Linen

1. Articles
   - Table Cloths (By the yard or in sets)
   - Napkins (By the dozen or in sets)
   - Tea Cloths
   - Tray Cloths
   - Doilies
   - Silence Cloths
   - Asbestos Pads
2. Weaves
   - Plain
   - Damask
3. Styles
   - Hemmed
   - Hemstitched
   - Scalloped
   - Drawn-Work
   - Embroidered
   - Fringed

E — Fancy Linens

1. Articles
   - Dresser Scarfs
   - Sideboard Covers
   - Table Covers
   - Squares
   - Cases for Handkerchiefs, etc.
   - Tea Napkins
   - Tray Cloths
   - Doilies
   - Luncheon Sets
   - Japanese Bungalow Sets

2. Laces
   - Filet (Real and Imitation)
   - Cluny (Real and Imitation)
   - Torchon
   - Duchess (Real and Imitation)
   - Renaissance
   - Venise
   - Arabian
   - Point de Venise
   - Filet

3. Embroidery
   - Cut Work
   - French
   - Irish
   - Azure
   - Appenzell
   - German
   - Madeira
   - Drawn-Work

F — HANDKERCHIEFS

1. Materials
   - (a) Linen
     - Handkerchief Linen
     - Hand Spun, Machine Spun
     - Sheer, Medium, Heavy
   - (b) Cotton
     - Cambric
     - Lawn
     - Voile
   - (c) Silk
     - Japanese
     - China
     - Crêpe de Chine
     - Pussy Willow
     - Chiffon
     - Georgette
   - (d) Mixtures
     - Shamrock Lawn (½ Cotton, ½ Linen)
     - Irish Lawn
   - (e) Laces
     - Armenian
     - Carick-ma-Cross
     - Duchess
     - Filet
     - Point Venise
     - Princess
     - Rose Point
     - Valenciennes

2. Styles
   - Regular
   - Mourning
   - Glove

Peter Thompson (Squares, ½ Squares)
English Squares

3. Sizes
   (a) Regular
      Women's (12 to 18 inches)
      Men's (20 to 22 inches)
      Children's (6 to 14 inches)
   (b) Glove (6 to 9 inches)

4. Decorations
   Hemstitching
   Drawn-Work
   Embroidery
      Madeira
      Appenzell
      Spanish
   Lace, Tatting
   Tape Border
   Cross-Bar
   Printing and Hand-Painting
   Rolled Edge

5. Colors
   White
   Plain Colors
   Two-Toned

6. Initials and Monograms
   Block
   Script
   Longfellow

Appendix

Leading Cotton Manufacturers in the United States

Acushnet Mill Corporation, New Bedford, Mass.	Sheetings, Twills, etc.
Amoskeag Mfg. Co., Manchester, N. H.	Tickings, Denims, Sheetings, Cotton Flannels, Print Cloths, Ginghams
Anderson Cotton Mills, South Carolina	Sheetings
Androscoggin Mills, Lewiston, Me.	Sheetings, Shirtings, Jeans, Seersuckers, Quilts
Arlington Mills, Lawrence, Mass.	Combed Cotton, Mercerized Yarns
Avon Mills Co., Lewiston, Me.	Cotton, Linen & Fine Turkish Towels, Crochet & Satin Bed Spreads, Bath Mats
Baltic Mills Co., New London, Conn.	Fine Lawns, Sateens
Bates Mfg. Co., Lewiston, Me.	Table Damasks, Seersuckers, Quilts
Berkshire Cotton Mfg. Co., Adams, Mass.	Organdies, Mulls, India Linens
Berkeley Mills, Berkeley, R. I.	Cambrics, Lawns, Nainsooks, Fine Cottons
Blumenthal, Sidney & Co., Shelton, Conn.	Velvets, Plushes
Booth Mills, Lowell, Mass.	Dobby & Plain Weaves, Drillings, Sheetings
Borden, Richard, Mfg. Co., Fall River, Mass.	Print Cloths, Fancy Weaves

Border City Mfg. Co., Fall River, Mass.	Sheetings, Shirtings, Crepes, Fancy Cloths
Bourne Mills, Fall River, Mass.	Twills, Sateens, etc.
Brandon Mills, Greenville, S. C.	Sateens, Sheetings
Bristol Mfg. Co., New Bedford, Mass.	Plain & Fancy Fine Combed Cotton Goods
Brookside Mills, Knoxville, Tenn.	Corduroys, Velvets, Ducks, Specialties
Butler Mill, New Bedford, Mass.	Fine Lawns, Organdies, Sateens, Fancy Goods
California Cotton Mills, Cal.	Warps
Chadwick-Hoskins Co., Charlotte, N. C.	Sheetings
Clifton Mfg. Co., Clifton, S. C.	Sheetings, Shirtings, Twills, Sateens, etc.
Continental Mills, Lewiston, Me.	Sheetings, Drillings, Print Cloths
Dallas Mfg. Co., Ala.	Brown & Bleached Sheetings
Darlington Mfg. Co., Darlington, S. C.	Shirtings, Prints, Sateens
Dartmouth Mfg. Corp., New Bedford, Mass.	Fine Cottons, Plain, Fancy & Jacquard Goods
Davis Mills, Fall River, Mass.	Fine & Fancy Goods
Edwards Mfg. Co., Augusta, Me.	Sateens, Flannels, Twills, Pillow Tubing
Erwin Cotton Mills Co., Durham, N. C.	Denims, Brown & Bleached Sheetings, Sheets & Pillow-Cases
Everett Mills, Lawrence, Mass.	Ginghams, Fine Shirtings, Denims, etc.
Flint Mills, Fall River, Mass.	Cotton Goods
Gosnold Mills Co., New Bedford, Mass.	Fine, Plain & Fancy Cotton Goods
Granite Mills, Fall River, Mass.	Plain & Fancy Goods

Grinnell Mfg. Corp., New Bedford, Mass.	Fine, Plain & Fancy Goods
Henrietta Mills, Caroleen, N. C.	Sheetings, Shirtings, Drillings, Print Cloths
King, John P. Mfg. Co., Atlanta, Ga.	Sheetings, Shirtings, Drillings
King Philip Mills, Fall River, Mass.	Lawns, Cambrics
Lancaster Mills, Clinton, Mass.	Ginghams, Shirtings, Fine Dress Goods
Lincoln Mfg. Co., Fall River, Mass.	Fine Goods
Locke Cotton Mills, Concord, N. C.	Plain & Fancy Dress Ginghams
Lockwood Co., Waterville, Me.	Sheetings, Shirtings
Lonsdale Mills, Lonsdale, R. I.	Fine Bleached Sheetings, Silesias, Twills
Lorraine Mfg. Co.. Pawtucket, R. I.	Dress Goods
Lyman Mills, Holyoke, Mass.	Lawns, Fancy Dress Goods, Drillings
Manville Co., Woonsocket, R. I.	Sheetings, Shirtings, Linings, Fancy Weaves
Mars Cotton Mills, Lowell, Mass.	Denims, Chambrays, Ginghams, Flannelettes, etc.
McLean, A. Co., Passaic Mills, Passaic, N. J.	Linings, Shade Cloth, Napped Goods
Merrimack Mfg. Co., Ala.	Lawns, Print Cloths
Nashua Mfg. Co., Nashua, N. H.	Blankets, Cotton Flannels, etc.
Naumkeag Steam Cotton Co., Salem, Mass.	Sheetings, Jeans, Sheets & Pillow-Cases
Page Mfg. Co., New Bedford, Mass.	Fancy, Plain, Fine Goods
Pacific Mills, Lawrence, Mass.	Prints & Fancy Cottons
Pacolet Mfg. Co., Pacolet, S. C.	Sheetings, Drillings

Pequot Mills, Montville, Conn.	Sheetings
Pilgrim Mills, Fall River, Mass.	Fine Goods
Pocasset Mfg. Co., Fall River, Mass.	Sateens, Twills, Plain Cloths
Ponemah Mills, Taftville, Conn.	Fine and Fancy Goods
Potomska Mills Corp., New Bedford, Mass.	Fancy Goods, Linons, Lawns
Pepperell Mfg. Co., Biddeford, Me.	Sheetings, Jeans, Drillings, Sateens
Renfrew Mfg. Co., Adams, Mass.	Colored & White Wash Goods, Table Damasks, Table Cloths
Sagamore Mfg. Co., Fall River, Mass.	Print Cloths
Slater, S. & Sons, Inc., Webster, Mass.	Sateens, Silesias, Percales, Sheetings
Soule Mill, New Bedford, Mass.	Lawns, Organdies, Fancy Goods
Spartan Mills, Spartanburg, S. C.	Brown Sheetings, Print Cloths
Stafford Mills, Fall River, Mass.	Print Cloths
Stark Mills (International Cotton Mills), Manchester, N. H.	Sheetings, Shirtings, Drillings, Ducks, Seamless Bags
Tremont & Suffolk Mills, Lowell, Mass.	Sheetings, Drillings, Canton Flannels, Cotton Blankets
Union Mfg. Co., Fall River, Mass.	Print Cloths
Union-Buffalo Mills Co., Union Mills, N. Y.	Print Cloths, Sheetings
Union Wadding Co., Pawtucket, R. I.	Wadding, Batting

Utica Mills, Utica, N. Y.	Sheetings
Utica Steam & Mohawk Valley Cotton Mills, Utica, N. Y.	Sheetings, Shirtings
Victor Mfg. Co., Greer, S. C.	Striped & Checked Madras, Dimities, Lawns
Wamsutta Mills, New Bedford, Mass.	Bleached & Brown Sheetings, Shirtings, Lawns, Sateens
Warren Mfg. Co., Warren, R. I.	Lawns, Sateens, Fancy Goods
White Oak Cotton Mills, Greensboro, N. C.	Denims
Whitman Mills, New Bedford, Mass.	Plain & Fancy Goods
York Mfg. Co., Saco, Me.	Ginghams, Denims, Dress Goods

Leading Linen Manufacturers *

John S. Brown & Sons, Ltd.	Belfast, Ireland
Ireland Bros.	Belfast, Ireland
Hillsborough Linen Co.	Belfast, Ireland
James Mathewson & Son	Dunfermline, Scotland
Hay & Robertson	Dunfermline, Scotland
R. E. Walker, Reid & Co.	Dunfermline, Scotland

Books for Reference

Spinning and Weaving

Cotton Spinning, R. Marsden. Macmillan, $1.75
Cotton Weaving, R. Marsden. Macmillan, $3
Origin of Inventions, O. T. Mason. Scribner, $1.50
Practical Treatise on Weaving and Designing of Textile Fabrics, T. R. Asherhurst. (Out of Print)

* Owing to the European conditions a complete list of linen manufacturers cannot be obtained.

Woman's Share in Primitive Culture, O. T. Mason. Appleton, $1.75

Textiles and Textile Fibers

Cotton Fabrics Glossary, A. Bennet. F. P. Bennet, $3
Encyclopedia of Dry Goods, G. S. Cole. (Out of Print)
Fibers Used in Textile and Allied Industries, Mitchell and Prideaux. Van Nostrand, $3
Flax for Seed and Fiber, U. S. Dept. of Agriculture, 5 cents.
Household Textiles, Charlotte McGibbs. Whitcomb and Barrows. $1.25
How We Are Clothed, J. F. Chamberlain. Macmillan, 40 cents
Methods of Textile Chemistry, F. Dannerth. Wiley, $2
Story of the Cotton Plant. F. Wilkinson. Appleton
Textiles, A. F. Barker. Van Nostrand, $2
Textiles, Wm. H. Dooley. Heath, $1
Textiles, Paul H. Nystrom. Appleton, $1.50
Textiles, Woolman and McGowan. Macmillan, $2
Textiles and Clothing, K. H. Watson. Am. School of Home Economics, $2
Textile Fibers, J. M. Matthews. Wiley, $4
The Story of Textiles, Perry Walton. J. S. Lawrence, $3

Dyeing

Dyes and Dyeing, C. E. Pellew. McBride Nast & Co., $2
Laboratory Manual of Dyeing and Textile Chemistry. J. M. Wiley, $3.50

Laundering

Approved Methods for Home Laundering, Mary Beals Vail. Procter and Gamble Co.
Laundering, L. R. Balderston, 1224 Cherry St., Phil., Pa. $1.25
The Practical Dry Cleaner, Scourer, and Garment Dyer, W. T. Brannt, Baird, $2.50